Self-Regulation as a Traffic Safety Strategy for the Older Driver

by

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B.S. Civil Engineering
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Abstract

The purpose of this study was to examine the relationship between formal traffic safety strategies currently utilized in the United States and the more informal methods of self-regulatory behaviors imposed by older drivers. A survey of the re-licensing requirements for older drivers within the 50 states was completed to determine the status of the states regarding re-licensing requirements for older drivers. Focus groups were conducted in Florida and Illinois to determine the extent of self-regulatory behaviors and thoughts about driving cessation of older drivers.

The results show that older drivers are using self-regulatory behaviors such as limiting driving during adverse conditions (such as poor weather, nighttime driving, and peak hour traffic). Education may play a crucial role in the process of self-regulation, as it may be used to encourage such behaviors to promote traffic safety. Most people have not planned for a time in which they can no longer drive, and transportation policy must attempt to address the mobility needs of seniors in the coming years.

Thesis Supervisor: Dr. Joseph F. Coughlin
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This thesis is dedicated to my grandmother, who at 81 still drives (yes, safely), and has so much energy that she wears me out! And to my family who has provided me with the resources I needed to make it through Georgia Tech and MIT. And Daniel Morgan, you have provided support in so many aspects of my life, for which I cannot thank you enough. I thank you all for your support and assistance.

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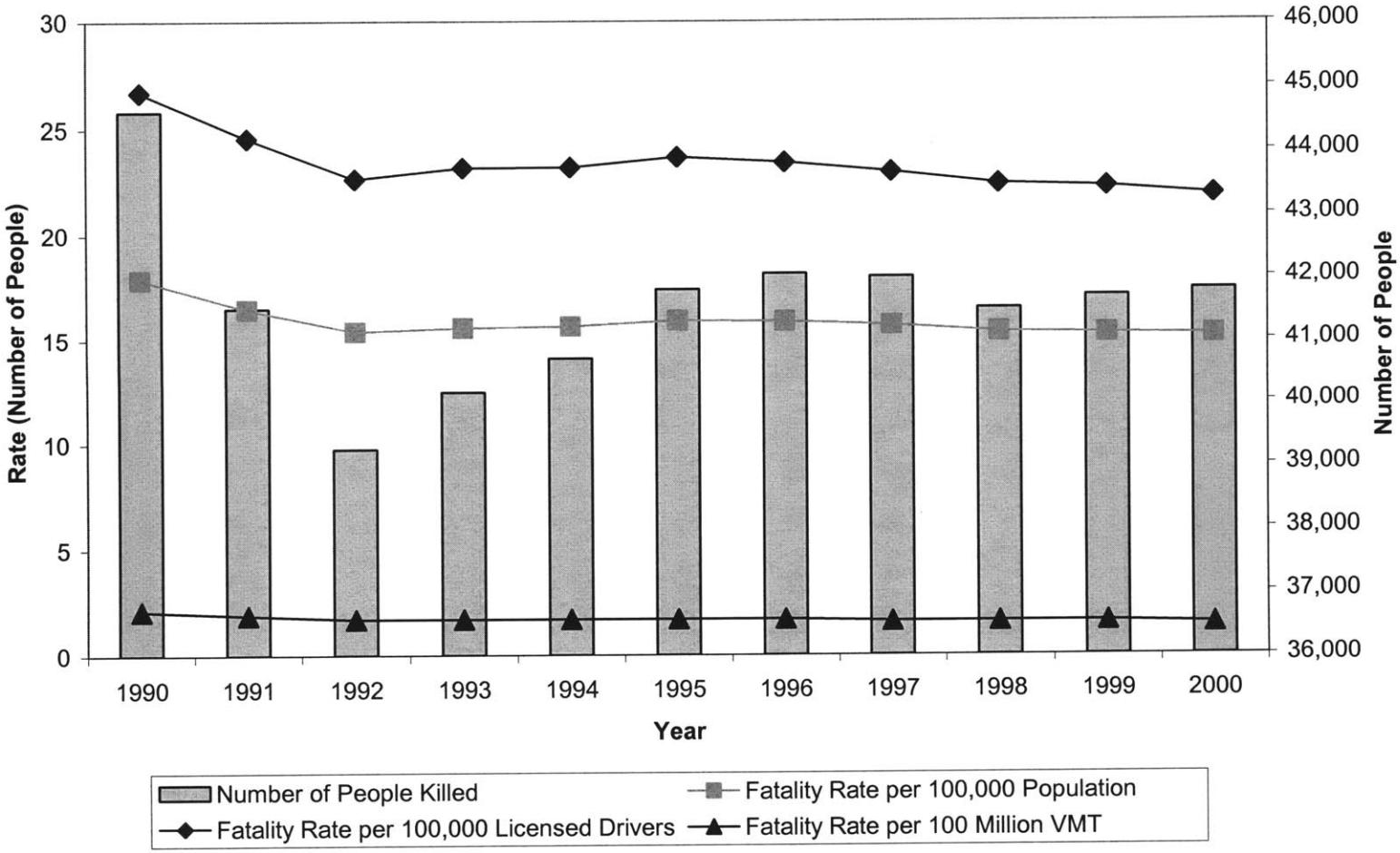
1: Introduction

Traffic Safety as a Public Problem

In a country where driving is the primary mode of transportation for millions of people, traffic safety is an important issue. Each year, thousands of people are killed or injured on the roadways, and some accidents are potentially preventable. Figure 1 shows the numbers of people killed in traffic accidents (as well as the fatality rates for) each year between 1990 and 2000.

Figure 1.1: Fatality Rates, 1990 –2000



Source: (National Highway Traffic Safety Administration 2000)

As can be seen in Figure 1, there were about 15 people per 100,000 killed in automobile crashes in the United States during the year 2000. While this number has been decreasing over the past ten years, traffic safety is a concern of everyone. In 2000 alone, there were over 37, 400 fatal crashes (National Highway Traffic Safety Administration). This means that on average, more than 100 persons are dying every day from traffic accidents. Over the past thirty years, the number of fatalities per 100 vehicle miles traveled (VMT) has been decreasing significantly. While this trend continues downward, policymakers should look into ways of reducing this number even further. Furthermore, while this number continues to decrease, the number of persons killed each year has not significantly decreased over the last ten years.

The cost of such crashes encompasses both economic and non-economic costs. Among these, direct costs include emergency treatment, initial medical costs, rehabilitation costs, long-term care and treatment, insurance administrative expenses, legal costs, and employer/workplace costs. Indirect costs such as physical pain and emotional damage are difficult to estimate in terms of money, but they are very real consequences of accidents. The estimated economic costs in the United States due to motor vehicle accidents in 1994 were $150.5 *billion*. Property damage alone accounts for about one-third of this cost (Blincoe 1994).

There are only three components that may be manipulated to promote traffic safety. First, the environment may be changed. That is, roadways may be modified in design to provide fewer curves or places where accidents occur the most. This may include changing the grade of a road or adjusting the alignment. Secondly, other physical aspects may be changed. This may include the car, signage, and traffic signals. For example, if there are many accidents at an intersection occurring because there is not enough time between the start of the red phase on one roadway and the start of the green phase on the other. This time is called red clearance, and if it is not sufficiently long, people will begin to enter the intersection before the other traffic has had time to clear the intersection. Lastly, people themselves may change. This issue is much more difficult to address, as has been proven by drunk driver statistics. People know that driving while intoxicated can be fatal, but people still choose to drive while under the influence. Young drivers believe that they are invincible, and no one (short of the driving schools, perhaps) has tried to address the idea of changing attitudes and behavior about driving too fast and recklessly. Thus far public policy in the United States has been focused on alternative ways to make older drivers safer drivers, with techniques such as graduated licensing, use of new intelligent transportation technologies, road signs with larger print, and insurance credits for people who voluntarily participate in a driver refresher course (Cobb and Coughlin 1998). The goal of this thesis is to determine which characteristics about older people may be manipulated to potentially improve traffic safety.

Many accidents have sources that are preventable. Road rage has become a large-scale issue recently within the media, and is associated with aggressive driving. Overly aggressive drivers engage in behaviors such as

changing multiple lanes quickly, excessive speeding or braking, and tailgating, etc. Fatigued drivers may fall asleep at the wheel, which can have catastrophic results. Drivers under the influence of drugs or alcohol frequently cause fatal crashes. When accidents are preventable people feel they should be at least minimized whenever possible, and these are all public problems, because they could affect anyone on the roadways at any time.

Older Drivers

Older drivers have become a popular topic lately regarding traffic safety. While some data suggest that older drivers are some of the most dangerous on the roadways, other data show that they are only a moderate risk. While traffic fatalities between 1990 and 2000 are down six percent, within the 70+ age group fatalities have *increased* by 10 percent (National Highway Traffic Safety Administration 2000). Even if older drivers are as much of a safety risk as teenagers, they often self-regulate and avoid driving very often, reducing their exposure and thus the chance of an accident (Glasgow 2000). These conflicting data do not create an adequate picture of what is happening among older drivers.

Several high-profile cases have recently brought older drivers to the public's attention. For example, in Missouri, a 91-year-old driver traveling the wrong way on an interstate killed 21-year-old Jason Suroff. The man was suffering dementia, and was found hundreds of miles away with no recollection of the accident. Suroff's parents then decided to attempt to change the system that allows drivers to remain licensed without further testing after the initial license in Missouri (Tortora 1999). In Toronto, 84-year-old Pilar Hicks drove her car home after hitting a woman twice and dragging the woman's body beneath the car (McCarten 2002). Cases like these highlight the worst problems within the older driver community, without noting that many older drivers are still more than capable drivers.

As the Baby Boomer generation grows, the population of people 65+ is expected to rise dramatically in the next 20 years. With this growing cohort the number of licensed drivers over the age of 65 will also increase, and the issues of safe driving must be addressed so that they may maintain safe mobility for the rest of their lives.

Public Policy

Nowhere is the policy ambiguity surrounding the older driver issue better demonstrated than by identifying what is old. Policymakers are hesitant to set an age beyond which a person is "old" because age is a term of great relativity. The science of aging and transportation remains unclear. While night vision deteriorates as early as 40 (and most people would hesitate to consider age 40 "old"), medical conditions or medications taken at a younger age may impair driver safety. In the face of scientific uncertainty the debate over the definition of an older driver is delegated to the political process. The politics associated with age-related restrictions are complicated and often lead many states to enact no special rules for people who are considered "older" (Coley and Coughlin 2002).

Policymakers also have difficulty classifying what "older" means because chronological age is a poor indicator of physical or cognitive capacity. Because people do note age the same way at the same time, requiring a driving test from one person at age 60 might be in order but it might well not be necessary in the case of a second individual. Sixty-five is a convenient and oft-used benchmark, but it can be highly arbitrary as a basis for determining a person's capacity for driving. More broadly, "old" is both a relative and subjective attribute. Many people consider anyone 15 or 20 years their senior to be "old." Someone 20 years old may well consider 40 to be old; someone who is 50 may feel the same way about someone 65. It is difficult therefore to regulate everyone of the same age if everyone varies, and there is no test that has been proven to be the "silver bullet" – one that provides the correct answer about whether or not someone should continue to drive.

Because policy has been unable to regulate older driver behavior in a manner that promotes safety and removes unsafe drivers from the roadway, the idea of self-regulation as a technique has become quite popular. There is a need to use personal behavior to increase safety among older individuals because the state legislations have not addressed the issue of older driver safety. With self-regulation, the driver is still in control and may have the option of maintaining mobility in a safe way. Much of the background within this thesis has been adapted from "State Older-Driver Relicensing: Conflicts, Chaos, and the Search for Policy Consensus" by Meredith Coley and Joseph Coughlin, published within the journal "Elder's Advisor: The Journal of Elder Law and Post-Retirement Planning" (Coley and Coughlin 2002).

Methodology

Results of this study indicate that many older drivers self-regulate, sometimes without realizing they do so. Education pays a role in the ability to successfully self-regulate, by addressing the changes that occur with aging and the ways to improve safe driving that people may use.

Several goals and questions were identified with this research, including a definition of self-regulation. These questions include:

- How does driver education shape and change driving behavior?
- What are some of the current driving patterns (of older adults) and how have they changed over the years (such as destinations and conditions)?
- How is age related to self-regulation among men and women still driving over the age of 70?
- What methods do older adults use to increase driving confidence and safety?
- What type of family conversations should take place surrounding driving transitions/changes associated with aging and self-regulation/driving cessation, and when should they occur?
- How (or if) people have planned for the possibility of not driving in the future (specifically transportation options)?

These questions are addressed through the chapters of this thesis. Chapter 2 (Older Drivers as a Traffic Safety Issue) explores the demographics of

the older population as well as specific safety concerns with the older driver. Chapter 3 (How States Regulate the Older Driver) describes the laws that are currently employed by each state regarding the license renewal of older drivers. Chapter 4 (Self-Regulation and the Older Driver) discusses the definition of self-regulation from a clinical psychology standpoint and then how it relates to driving behaviors. Chapter 5 (Focus Groups Findings) summarizes the results of the focus groups that were held for data collection purposes. Chapter 6 (Conclusion) summarizes this thesis and provides suggestions for future research based on the results.

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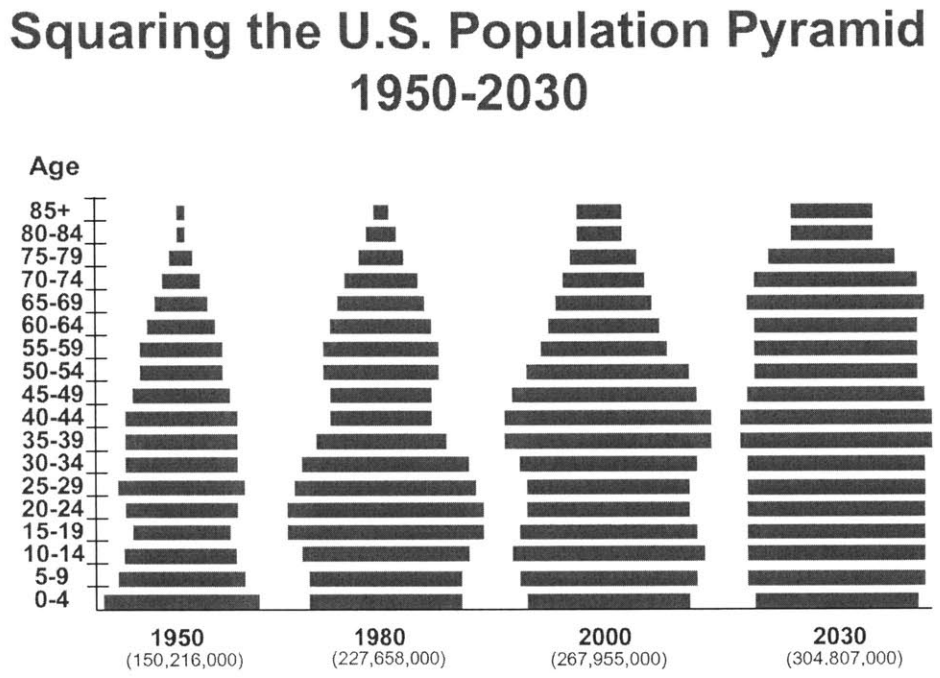
2: Older Drivers as a Traffic Safety Issue

Older Driver Demographics

Traffic safety is often generalized into absolutes: the youngest and oldest drivers are dangerous; women are safer drivers, men do not read maps, etc. Roadway geometry, traffic signal timings, and signage are all part of traffic safety as well, organized to promote safe roadways. People are concerned with traffic safety because someone else might just cause an accident that involves their own vehicle. Automobiles are seen as a safe way to travel (because the driver feels "in control"), but they can be quite dangerous at the same time. Older drivers have been discussed in the media quite often as of late, as the topic becomes relevant to many people with family members approaching an age where they must consider that one day they will no longer be able to drive safely.

As the number of older Americans rapidly grows (shown in Figure 1), the number of licensed drivers over 65 grows as well. This growth is spurred by the general growth in population as well as a lengthened life expectancy, resulting in an increased size of cohorts over the age of 65. As can be seen in the figure, there is a large contingent of population that is expected to increase the number of people over age 65, also known as the Baby Boomer generation (those born between 1946 and 1964). In 1980 they were primarily between the ages of 15 and 30, in 2000 they were between the ages of 35 and 50, and as projected for 2030 will be between the ages of 65 and 80.

Figure 2.1: Squaring the US Population Pyramid, 1950-2030

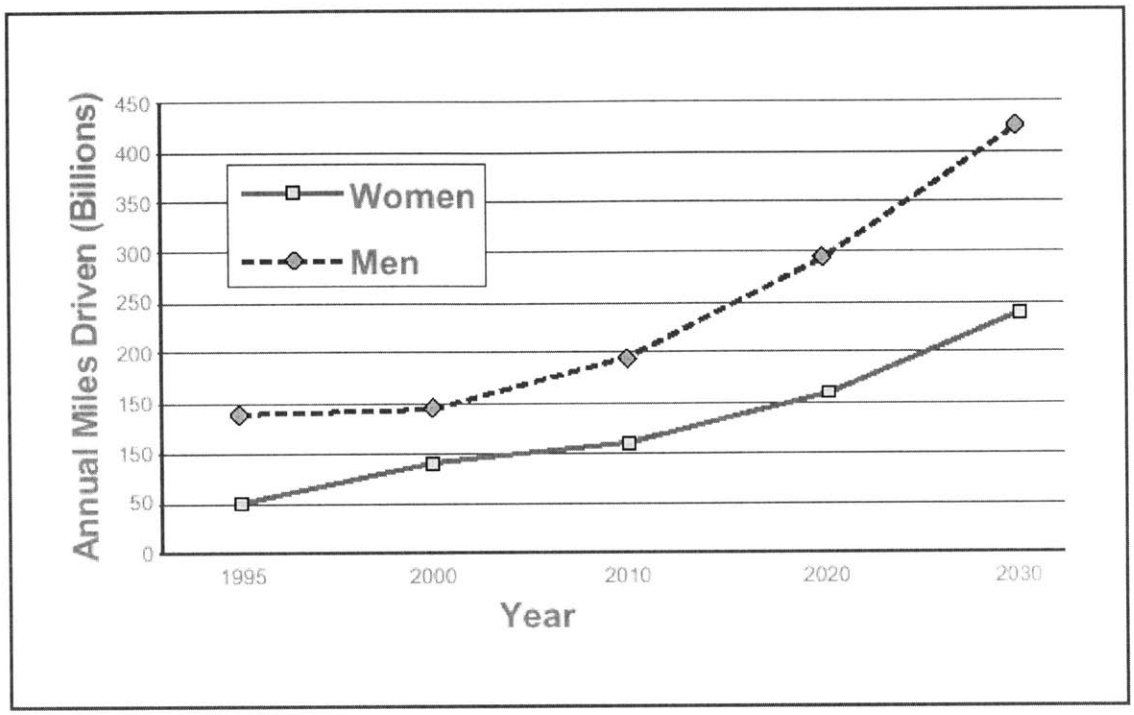


Source: (US Census)

Automobile Reliance

As mentioned, with the increasing number of aging adults, the number of older drivers is also increasing. One study, for example, suggests that the total vehicle miles traveled (VMT) by the elderly may double over the next 20 years and triple over the next 30 years (Burkhardt, Berger et al. 1998). Accurate predictions of elderly driving in the future are difficult because attitudes of the general population are changing. For example, the difference in miles driven between elderly males and elderly females is expected to decrease in the coming decades, because the women who will be elderly in 20 years drove more as younger adults (Burkhardt, Berger et al. 1998). This projection may be seen in Figure 2.

Figure 2.2: Actual and Projected Total Annual Miles Driven for 65+ Population



Source: (Bush 2001)

The Baby Boomer generation has changed attitudes over the last 50 years, and will continue to do so in the future. "As the number of older adult drivers increases, distinguishing those who are safe from those who are unsafe will become an increasing public health challenge" (Young 2001).

For many people of the Baby Boomer generation and their children, the car has become a way of life. In the United States, transportation is known as driving, because most Americans, young and old, choose to use the car as their primary mode of transportation. Driving, however, means far more than just a mode of transportation. Acquiring a driver's license is a rite of passage from youth into adulthood. For older people, the "right to drive" is paramount to personal freedom and independence (Coley and Coughlin 2002). In fact, more than 80 percent of persons aged 50+ indicate that driving is their primary mode of transportation (Ritter, Straight et al. 2002).

Driving as a primary transportation mode has extensive history in the United States. Within three decades (between 1929 and 1958), the car began to be known as a symbol of prosperity, particularly American prosperity. Reasons for the dramatic increase in automobile ownership range from poor public transit alternatives to consumer preferences and advertising (Gordon 1991). In fact, by 1992 there was more than 1 car per licensed driver in the United States. Additionally, approximately 85 percent of personal trips in 1990 were taken by car (Coughlin 1994). Economic and social conditions along with public-policy decisions, such as "material prosperity and progress through unlimited production and consumption of consumer goods, and the fusing of rural and

urban advantages in a suburban Utopia" have led to an environment in which people desire a car and personal auto-mobility (Fink 1988). This type of lifestyle makes the issue of older drivers all the more meaningful because people do not want to give up their personal mobility. The amenities found within the car are reason enough for most people to choose driving over any other mode of travel (Coughlin 1994). Older adults have spent most of their lives driving, and the idea of someone else telling them they cannot drive any longer is unthinkable to most people.

The ability to go where you want, when you want is routinely identified by older people as an important part of their personal identity. The driver's license is often thought of as a "personal identikit" for older people. Older adults perceive the loss of driving privileges as synonymous with being "handicapped and disabled," neither of which are particularly desirable to people who were once (and usually still are) able to take care of themselves (Coughlin 2001). Beyond the desires for independence and freedom, researchers have observed a marked decline in mental as well as physical well-being as a result reduced mobility and driving cessation (Marottoli, Mendes de Leon et al. 1995; Marottoli, Mendes de Leon et al. 1997; Coley and Coughlin 2002). Older adults who are no longer able to drive, either from a physical or legal standpoint, often become depressed, withdrawn, and isolated (Young 2001).

Both the numbers and characteristics of the next generation of retirees suggest that driving will be an even greater part of healthy aging. The baby boomers are likely to be in better health, have higher incomes, and more education than their parents and grandparents. Together, these characteristics contribute to a future generation of people that are likely to forge a lifestyle of active aging (AARP 2001). If people have enough disposable income, relatively good health, and a wide range of interests (social activities, hobbies, part-time work, continuing education, volunteer work), they will want to engage in an active life beyond retirement – relying on the car as they did when they were younger (Coley and Coughlin 2002).

Some researchers have already forecasted a rise in driving by older adults. One study, as mentioned previously, suggests that the vehicle miles traveled by people 65 years old and older may double over the next 20 years and triple over the next three decades (Burkhardt, Berger et al. 1998). More active and independent lifestyles of women now are likely to be a significant factor of future travel demand for older women (Bush 2001; Coley and Coughlin 2002).

Closely linked to the dependence upon automobiles is the lack of available public transit for older adults. While there are many programs funded by the Federal Transit Administration (FTA) and the Department of Health and Human Services (HHS), many older adults live in places where access to these services is very difficult (Coughlin and Lacombe 1997; Cobb and Coughlin 1998). Even when public transportation is available to older adults, many have difficulty accessing the system due to physical reasons (too far to walk, uncomfortable climate, etc.) while others view public transit as unsafe (Cobb and Coughlin 2000; Coughlin 2001; Ritter, Straight et al. 2002). Personal comfort is also considered an issue by many older adults, as public buses often accelerate and

decelerate quickly, jostling persons. The step between the ground and the bus is often quite high, which can be very difficult for older persons (Coughlin 2001; Ritter, Straight et al. 2002). Even finding a seat on public transportation can be difficult at times, particularly during peak hours. Current society finds that people are more reluctant to offer a seat to other people, which is often as seen as a lack of consideration by older adults.

Unfortunately, even private services that currently exist do not cover all needs for the elderly, as the trips are categorized according to the provider's hierarchy of importance, not importance to the individual (Coughlin and Lacombe 1997; Coughlin 2001). Additionally, these services are not always well published or easy to find information regarding schedules. The need for advance scheduling is also perceived as negative, and they provide a lack of flexibility that is often desired. One study noted that one negative attribute of such services is that the provider may be late to pick them up from their destinations or even from home (Coughlin 2001). Another study found that only five percent of older adults (age 50+) use public transportation as their primary mode, and one percent primarily using senior vans (Ritter, Straight et al. 2002).

Characteristics of the Aging Driver

Within the context of physical changes associated with aging, the discussion of older driver safety ultimately arises. Are older people mentally and physically capable to drive? In most cases, the answer is yes. However, regardless of age, sometimes a person's mental or physical capacities are such that driving is hazardous, both to the individual and to others on the roadways. Previous research has addressed this question, as "the first formulation of the 'age-related problem' was conceptualized as a general age-related safety problem with a focus on functional deficiencies and the first proposed safety measures also were mostly dealing with the driver, either through remediation or through exclusion from the driver population" (Hakamies-Blomqvist 1999).

As physical, mental, and cognitive capacities begin to change, driver performance can also be affected. Age-related disease may influence driving capacity. Medications taken for treatment of those diseases may also affect a person's ability to drive safely. Because the effects of aging are vary among people, what remains unclear is at what point aging affects driving capacity. For some people, daily activities of life become more difficult to accomplish, and everyday actions simply become more challenging. For others, good health and active living continues beyond retirement and well into "old age" (Coley and Coughlin 2002). In fact, even differences between cohorts may be seen when evaluated at the same age. For example, the Baby Boomers may differ significantly from the Matures (those born between 1909 and 1945) with respect to changes in driving ability. Additionally, women who receive a drivers license today will typically have more experience driving during their lifetime than did women who received a drivers license 50 years ago. The different generations are exposed to differing environments during their life span, which could affect persons of those eras differently (Meyer and Coughlin 2001).

Lifestyles are changing, and according to Meyer and Coughlin (2001), the aging process is "a social process in which a person changes her or his

involvement in activities and obligations," as well as a physiological process that affects biological change. The example cited suggests that older people do not drive during rush hour or inclement weather because they no longer need to travel regularly for employment. While more and more people are choosing to work into what was traditionally the retirement years, their driving capabilities might differ significantly from someone who has reduced driving to only a few times a week.

Aging changes include poor vision at night and weaker contrast sensitivity, affecting people as early as age 40 – hardly an age that most would feel comfortable calling old. Most people also experience an increased sensitivity to glare, which can affect nighttime driving. Roadway signage becomes much more difficult to read with these visual changes (Coley and Coughlin 2002). As many of the older driver safety questions arise from changes associated with aging, Table 1 discusses some of these visual changes. Some of the problems occur in relatively few people, while others are more widespread.

Table 2.1: Visual Impairments Associated with Aging

Visual/Perceptual Impairment (Deficit)	Effects on Driving
Depth Perception (Ability to judge distances. Dependent on stereopsis, which is binocular appreciation of three-dimensional space. Most so-called depth perception tests assess stereopsis.)	• Timing of turns • Stopping Distance • Timing of pulling out into traffic • Lane position • Difficulty in merging or in blending with traffic • Distance judgment • Stops too soon or goes over line at intersections • Difficulty in parking lots
Acuity	• Delay in responding to environment (due to difficulty in anticipating and detecting hazards) • Can't read street/highway signs and other info • Increased difficulties in low light conditions
Blurred or Double Vision (May be a result of the following eye diseases: Diabetic Retinopathy, Cataracts, Macular Degeneration)	• Delay in ability to recognize threats • Slow to recognize signs • Difficulty staying in lane • Eyes may be more sensitive to light and glare making night driving more difficult

Visual/Perceptual Impairment (Deficit)	Effects on Driving
Visual Attention/Fixation (The act of keeping one or both eyes pointed directly at an object of regard for as long as needed or requested.)	• Distractibility • Difficulty maintaining lane position • Staying at traffic signals too long
Visual Field Cut (May be seen with spatial body neglect and is associated with frontal lobe damage and left or right occuloparietal and parietal damage. Client fails to "see" all relevant information or is missing a particular zone in his/her peripheral field.)	• Missing streets or stimuli on neglected side • Difficulty maintaining lane position • Following the edge of the road • May not see vehicles during quick glances for lane changes • Denial See also peripheral vision
Color Discrimination	Diminished ability to perceive differences in color, usually for red and green
Accommodation and Focusing (The ability to automatically and without strain, bring near objects into clear focus. Relaxation of accommodation allows distant objects to become clear.) Also: Convergence and Divergence (The ability to smoothly and automatically bring the eyes together to look at things closely, or move them apart)	Driving requires a flexible accommodation system, to allow the driver to shift from far (intended path of travel) to near (speedometer, rear-view mirrors) Deficit may result in difficulty: • Reading street signs • Interpreting speed from speedometer • Using information seen in mirrors • Positioning vehicle in turns and curves Client is likely to drive slow in order to have the time to figure out what is happening

Visual/Perceptual Impairment (Deficit)	Effects on Driving
Ocular Motility/Range of Motion/Pursuit Movements (The ability to coordinate and move the eyes smoothly through all planes)	• Diminished ability to attend to all stimuli in the environment; will likely miss the most important information • Difficulty maintaining lane position • May be slow in pulling out into traffic • May miss stimuli in the environment (signs, pedestrians, bicyclists) • Usually poor at dealing with intersections or cross traffic • May stare at road scene • May move eyes randomly and be distracted by any movement Practitioner may observe clumsiness or lack of balance
Peripheral Vision	• Misses stimuli in the environment • Timing of turns may be off • May not see cross traffic
Impaired Figure-Ground Discrimination	• Unable to distinguish foreground from background • Difficulty finding STOP sign among other stimuli in environment • Difficulty as traffic increases and/or road scene increases in complexity • Difficulty finding controls or dashboard information quickly
Parts-To-Whole Deficits	• Can "see" individual items in road scene but may not realize what's happening in the whole environment • Unable to look ahead in anticipation of potential threats (e.g., may see stopped cars, police cars, and ambulances, but not recognize that there has been an accident)
Position in Space Deficits	• Unsure of position as related to another object • Problems particularly when close to other objects, such as in parking lots • Will often go past limit line or stop too early • Trouble orienting vehicle when in curves or coming out of turns

Visual/Perceptual Impairment (Deficit)	Effects on Driving
Impaired Right/Left Discrimination	• Confused right and left • Ends up on wrong side of road • Puts turn signal on for opposite direction of intended turn

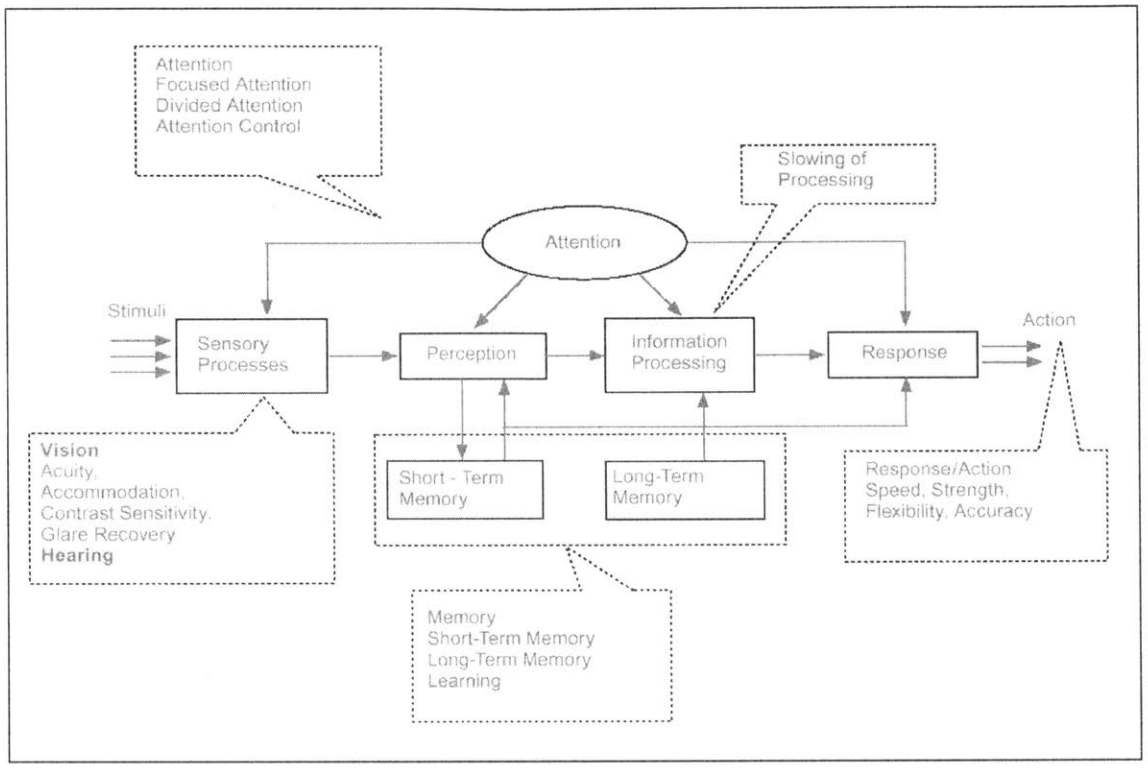
Source: (US Department of Transportation and National Highway Traffic Safety Administration 1999)

As seen from Table 1, a person's peripheral vision may be affected by a stroke occurring in the right posterior brain, which can lead to left neglect syndrome. Persons with this problem tend to ignore input from the left half of their world, but they may maintain excellent language skills, which leads most observers to think they are adequate drivers (Young 2001). Such conditions should be noted by family members who believe that a loved one might be incapable of safe driving.

Decreased strength and flexibility also accompany aging. Some people experience greater difficulty entering and exiting the car in addition to greater difficulty rotating the neck and trunk, critical to adequately compensating for natural blind spots and obstructions to vision. Certain medical conditions also have the potential to impair driving ability. These include (but are not limited to) heart disease, lung disease, arthritis, and stroke (Coley and Coughlin 2002).

Cognitively, response times often become slower, and reactions to sensory inputs slow with age (Fischer 1999). In the case of accidents, a split second decision can be the difference between an accident and a close call. Stress may also contribute to even slower reaction times. Older drivers sometimes have difficulty dividing their attention among the subtasks that accompany driving, e.g., cell phone use (Coley and Coughlin 2002). As shown in Figure 3, many cognitive inputs are required to process driving tasks. These inputs begin to change over time, and include slowed processing time in addition to physical changes such as vision and hearing loss.

Figure 2.3: Age-Related Changes in the Information Processing System



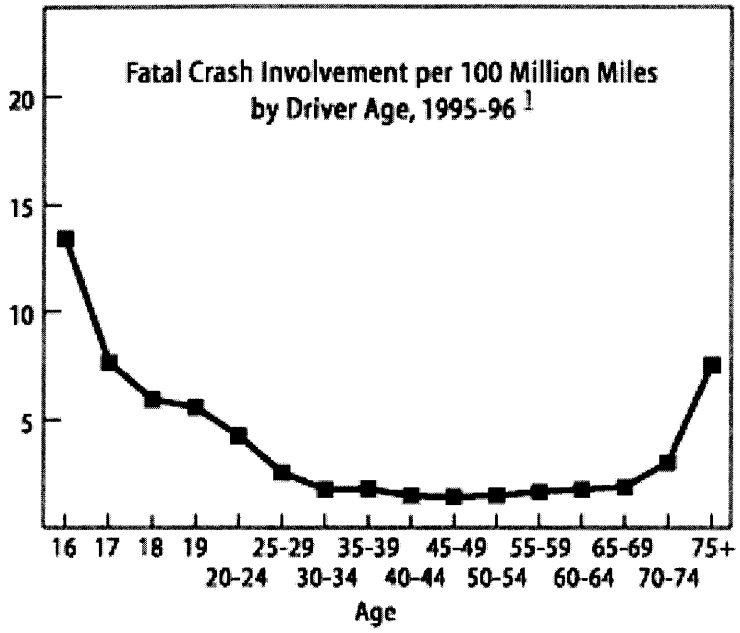
Source: (Meyer and Coughlin 2001), model based on (Wickens 1993)

Age related changes are not to be seen as isolated phenomena. They are related and may interact to impair driving performance at any time (Meyer and Coughlin 2001). Most of the inputs from Figure 3 relate to attention, which may be affected by aging, therefore causing potential problems related to driving ability. Attention, memory, information processing, decision-making, and motor behavior may all be affected with the aging process to impair driving. These should be considered for self-evaluation as well as evaluating someone else. Their complicated interaction could lead to a situation in which someone is not safe when behind the wheel, but determining the level at which someone is impaired can be difficult.

Safety Concerns

With the influx of so many older drivers, safety becomes a concern among drivers of all ages. Functional changes in physical and cognitive processes may be partly responsible for increases in older driver accidents and fatalities (Coughlin and Tallon 1998). One interpretation of older driver safety may be based upon the fatal crash involvement per 100 million miles driven by driver age group. When plotted as shown in Figure 4, these data form a "U" or a "bathtub" like line that shows drivers between 16 and 24 and those 70+ are the most likely to die in a crash. It must be remembered, however, that when looking at the number of fatalities per 100,000 population, elderly men and women are still at much less risk than people younger than 35 (Williams and Graham 1995).

Figure 2.4: Fatal Crash Involvement per 100 Million Miles by Driver Age, 1995-96

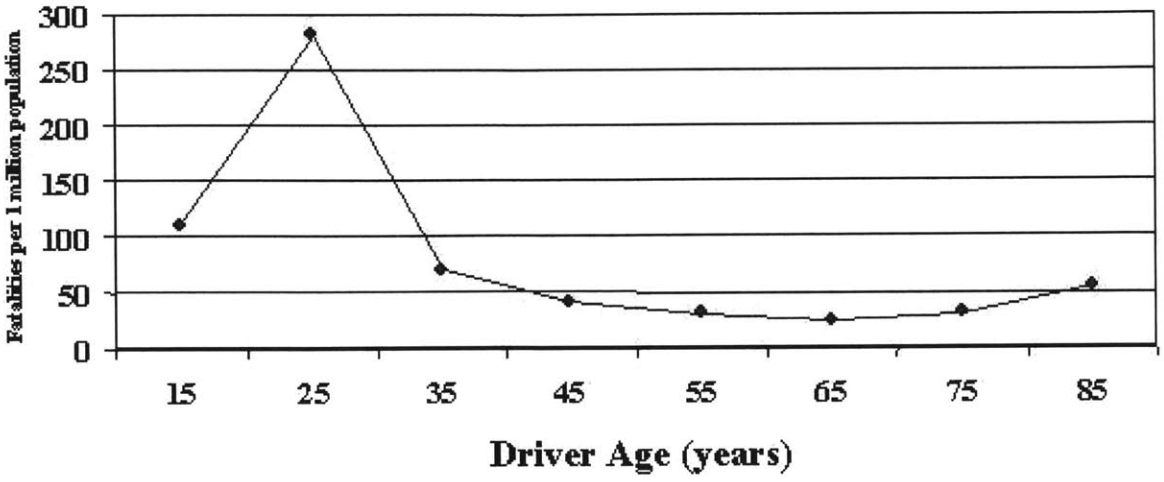


Source: (US Department of Transportation 1996)

Pointing to these data, advocates of "tougher" re-licensing regulations argue that older drivers are a hazard to themselves and others on the road (Coley and Coughlin 2002). Reasons for the higher fatality rate after age 65 are questioned, though some believe that physical frailty and decreased cognitive and physical function may be related (Coughlin and Tallon 1998). Additionally, the sampling bias known as the frailty bias occurs with older drivers because an older person is more likely to injured given physical impact. To this end, people argue with this graph because they believe that that it overstates the risk posed by older drivers. Further reasons for the differences in fatalities are difficult to identify whether they occur due to the aging process or because of differences in generational experience (Bush 2001).

However, a second interpretation can be drawn from traffic safety statistics. These data indicate that older drivers are only a modest risk compared to other groups. If fatalities are plotted per one million people and age group, an image emerges that portrays older adults as among the safest with the youngest cohort – those age 16-24 – as the most likely to die on the nation's roads (Coley and Coughlin 2002). As shown in Figure 5, the number of fatalities with respect to 1 million population rapidly decreases after age 25, and only slightly increases after age 65. While this graph is for male drivers, fatality rates for female driving cohorts has not risen appreciably with older age (after the initial drop at age 20). This image shows that older drivers might be the safest drivers (US Department of Transportation 1996).

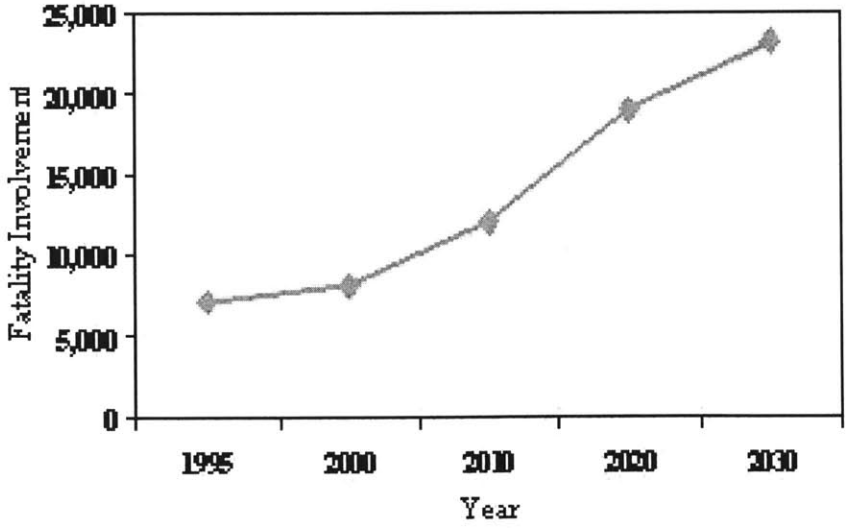
Figure 2.5: Projected Driver Fatalities per Million Population



Source: (US Department of Transportation 1996)

As the number of licensed drivers over age 65 increase, research suggests a dramatic increase in the future number of older driver fatalities converging with boomer reliance on the automobile to meet transportation needs. Projected older driver fatalities may approach 20,000 per year in 20 years compared to approximately 7,000 deaths today, as shown in Figure 6 (Burkhardt, Berger et al. 1998). Additionally, as educational levels of those aged 65 and older increase in the coming years, travel is expected to be increased among those cohorts (Bush 2001).

Figure 2.6: Projected Elderly Driver Fatality Involvement Rate, 1995 to 2030



Source: (Burkhardt, Berger et al. 1998)

Future fatality rates will also depend on the transportation demand from the Baby Boomer generation. Transportation demand varies with educational

and lifestyle differences between generations, and how the generations view the automobile as the only answer to the question of mobility (Bush 2001).

Most older drivers compensate for the changes they experience with aging by self-regulation, that is, they choose not to drive in conditions in which they feel uncomfortable: operating at night, major highways, poor weather, etc., thereby reducing their exposure to hazards and the chances of accidents. Chapter 3 will further address how the laws regulate the older driver in addition to the informal methods used.

3

3: Current Regulation Practices

Regulating the re-licensing of the older driver has become a popular issue over the past few decades. As mentioned in Chapter 1, advocacy groups representing accident victims pressure the state governments for policy change regarding stricter laws governing older-driver licensure (Cobb and Coughlin 1997). While many feel that driving until death is perfectly acceptable, many others believe that traffic safety is as issue that should be addressed at all ages. To this end, many people question a test given only after a certain age because they feel it discriminates unfairly against older people.

Within traffic safety, the problem definition of older drivers is crucial to the development of the issue, because it will affect how many people become involved (Rochefort and Cobb 1994). If the issue can be defined as one that affects everyone (i.e. traffic safety is threatened by these older people who are poor drivers) then more people will become involved in the debate or discussion, leading to even more conflict and chaos. According to Rochefort and Cobb (1994), "issues may be connected to sweeping social themes, such as justice, democracy, and liberty" to increase participation. When one views the right to drive a liberty for everyone, it becomes more difficult to enact policy changes that affect only older drivers.

Coughlin (1994) states, "the management of individual behavior and its impact on the commonwealth is derived from how people agree to live with each other and on the basis of what values they choose to share common resources." While Coughlin discusses the values of community versus individuals in reference to traffic congestion and environmental values, these thoughts could be expanded to refer to the values of driving while aging. If the common resources are thought of in terms of the roadways, the values may be those of an individual's desire to drive versus the safety of everyone else. American society focuses much on the value of the individual without much thought to the common resources and needs. It is a need of society to have safer roadways but most people do not consider this need when deciding to continue driving even beyond what may be considered safe. Individual rights are of utmost importance to groups such as the AARP, the American Association of Retired Persons.

Additionally, "although institutional factors and the characteristics of an issue are certainly strong influences, the political process and policy products of problem definition are greatly determined by the mix of participants and the values they introduce into the policy debate" (Coughlin 1994). The values brought forth by elder advocacy groups (such as the AARP) are those of mobility

for all persons regardless of age and the rights that older adults are entitled to. Selection of language is very important when shaping the policy problem and debate, using words that are powerful and that create positive images (Coughlin 1994; Rochefort and Cobb 1994). So far, the states have responded with very little regulation for drivers as they age, for a variety of reasons.

Regulating Driving for All Ages

Driver licenses in the United States are given and maintained by the individual states, but all states require a road test for the first license a person receives. In many states this first test is also the last that is required for the remainder of the person's life.

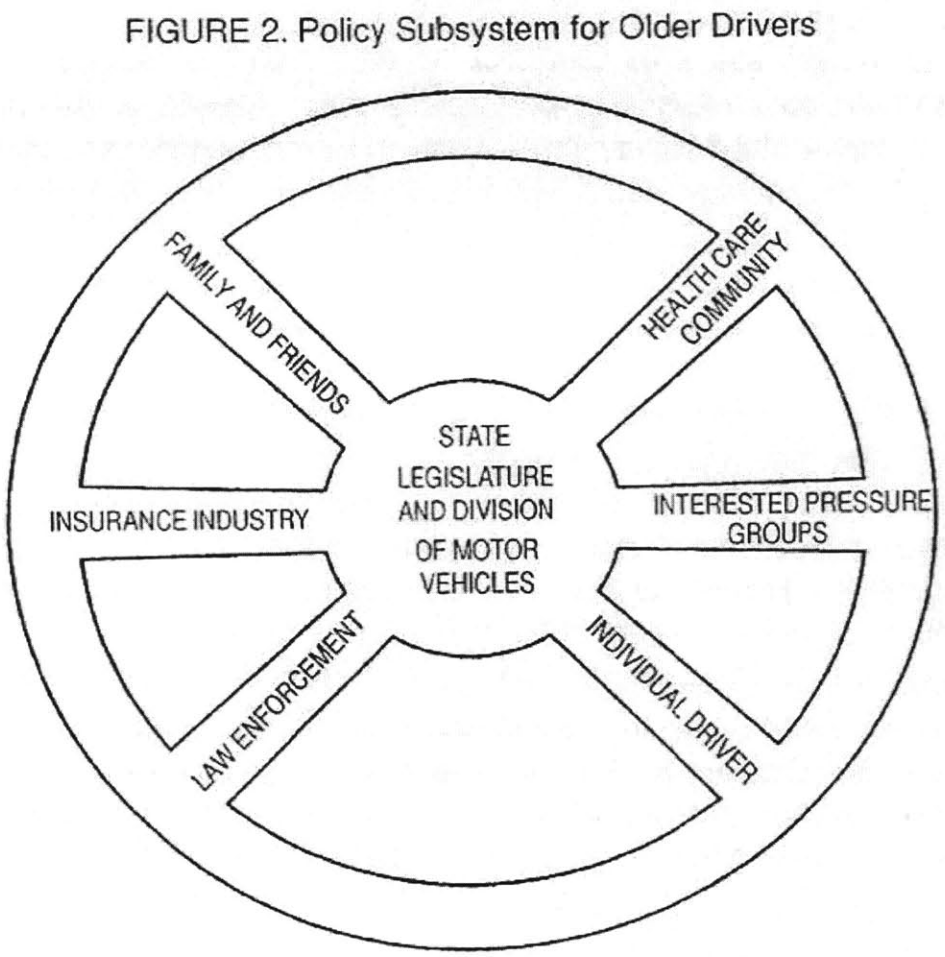
The requirements to maintain a license in most states are fairly meager, due in part to the fact that the state agencies that fund such programs are not well funded. Nor are these agencies well liked. In general, the state Departments of Motor Vehicles (sometimes the Department of Public Safety) or the equivalent, are the organizations that people love to hate. They are known for long lines, slow processes, and many feel that a trip to the DMV means a waste of time.

"Among the state licensing agencies there is no single policy approach for identifying unsafe elderly drivers" (Cobb and Coughlin 1997). The individual states run their driver license programs differently, based upon different budgets and different priorities. This kind of state diversity leads to very different outcomes for the same type of driver. For example, if an older driver wanted to renew his license in state A, he might be granted the renewed license, but based on additional requirements by state B, he would not be able to renew in state B.

Regulating Older Drivers, Trends

Regulating the older driver is, as mentioned previously, often a political issue. There are many subgroups that interact with the state legislation and Departments of Motor Vehicles, each with different interests and concerns. As seen in Figure 1, at least six groups interact to assist and sometimes hinder further legislation for licensing older drivers.

Figure 3.1: Policy Subsystem for Older Drivers



Source: (Cobb and Coughlin 1997)

Law enforcement agencies interact with legislation by reporting traffic violations, while the insurance industry sets policy rates. Both groups therefore have a vested interest in the most current legislation. They keep certain drivers off the roads with the use of citations, suspended licenses, and higher premiums. Individual drivers and their family and friends also interact to influence regulation, through voluntarily giving up driving and the reporting of unsafe drivers.

The health care community is also involved in the process of licensed older drivers because they are encouraged in some places to report medical conditions that might interfere with driving. While this seems like a good idea, it can damage the doctor-patient relationship and make doctors unwilling to report potentially dangerous drivers. This relationship is described further in Chapter 4. The last but perhaps most influential section is that of interested pressure groups such as the American Association of Retired Persons (AARP). These types of organizations oppose legislation designed only for older drivers because they do

not want the laws to discriminate against older adults. The most likely legislation to be passed would be one in which the licensing rules are targeted for everyone, not just a certain age group (Cobb and Coughlin 1997).

In addition, many pressure groups are formed from families of victims of accidents. For example, these groups have been formed in California, Massachusetts, Missouri, Maine, and New York, just to name a few. While these groups might be threatening, they often do not have the support and staff of organizations such as the AARP. These groups are also supported by the public immediately following a well-publicized accident, but after time interest wanes (Cobb and Coughlin 1997). They also tend to define the "older driver problem" as an issue of public safety and health (Coley and Coughlin 2002).

In the past, two trends have directly worked against each other within the realm of driver re-licensing policy. The first is the desire of the states to reduce the burden on the public as well as the licensing agencies by limiting the testing required of licensed drivers. The agencies may save money and thus require fewer employees, which greatly benefits the taxpayers or even individuals who pay for renewed licenses. The second, conflicting trend is that of increased liability on the part of the states themselves. As older adults are growing within the population and the states may be responsible for licensing a driver who clearly should have had the license revoked (Waller 1988).

After all the political issues have been discussed (and resources exhausted), the states are left with few tools with which to regulate the older driver. The political capital available to press the issue is lacking across the board to develop a single, consistent policy. One must also remember that the driver licensing process cannot predict an individual's performance (Waller 1988). While one segment of the population may have higher crash rates, one cannot individually assess each person who comes through the door and know if that person will be the one who causes a crash. The licensing process should be used to determine if candidates possess the criteria required to maintain a drivers license (Waller 1988).

The policy movement has a certain lifecycle that may be tracked, beginning with a crash. First, the media becomes involved, framing the event as a question of whether "older drivers" are safe or a roadway hazard. The interest groups discussed earlier mobilize to engage state legislators for two things: to pass legislation to restrict or strengthen older driver re-licensing requirements, or to redefine the issue as the need to identify operator impairment at any age – not just old age. The media debate and hearings that typically follow an accident are most often fueled by an accident where one or more people are injured. Grieving parents of a dead child are most often at the center of the political conflict in those states where there has been significant mobilization to legislate restrictions or special requirements for older drivers (Coley and Coughlin 2002).

At the other end of the spectrum, those wishing to contain the momentum of additional regulations are typically older adults who respond to these demands as understandable, though misguided, efforts to impose unfair and discriminatory restrictions on a group of people based solely on age. Those opposing age-based restrictions argue that policy should be shaped to identify the "impaired

driver" of any age – not competent drivers who happen to be "old." They look to the fact that no test has been developed that may adequately predict the safety of any individual driver, and therefore the states do not have the right to remove a drivers license based upon a person's age. These individuals and groups view their cause as defending the right of older adults to be treated like any other driver as a matter of policy equity. Their inspiration is powered by the not so subtle reality that the driver's license is key to most people's identity, freedom and independence (Coley and Coughlin 2002).

Both sides leverage to their political advantage the ambiguity surrounding the question of what is an older driver and how are traffic safety statistics to be interpreted correctly, discussed at length in Chapter 2. Legislative hearings are held; proposed legislation is debated. Most often the issue is quickly displaced by other events, occasionally incremental changes are made to licensing laws governing older drivers. The opportunity to leverage the event and debate into a more comprehensive discussion about the need for transportation options beyond the automobile and a systematic examination of how we test and license drivers of all ages is lost during this lifecycle. Instead, what is left is a fragmented, sometimes chaotic, set of regulations that are combined into the nation's response to the transportation needs of today's older adults (Coley and Coughlin 2002).

Governing agencies maintain an inherent resistance to change, which makes the issue more difficult to appropriately address. Program administrators and examiners must be included in any discussion about policy change so that their comments and suggestions are heard (Waller 1988). Additionally, political executives and cabinet secretaries in the United States maintain tenure of only 2 ½ to 3 ½ years, during which time there are many issues and debates to consider. For any ruling or policy to last, the effective date must be within this time frame. If a successor does not agree with a policy of a predecessor, it may or may not be enacted or enforced (Hazard 1989). Such a short period of effectiveness weakens the ability of any governing authority to develop an appropriate, accepted model of policy.

Within society there is often a lack of understanding surrounding testing with regard to the older driver issue. Even if states arrive at a policy consensus within the many jurisdictions to test after a certain age, what is the most appropriate and effective test? A plethora of exams are available, each with their proponents and requisite number of supporting studies. However, no clear scientific or policy consensus exists on what and how to test a driver at a particular age (Coley and Coughlin 2002). It should be noted, however, that research has indicated that state renewal tests for re-licensing are associated with lower licensure rates of older adults (Levy 1995). Therefore any test implemented will likely result in lower licensing rates within the older adult cohort.

A written exam or a few minutes of road time is hardly a true assessment of driver capacity – although it remains the threshold for the first license. Unfortunately, there is no clear scientific consensus on the perfect test to determine a driver's abilities. Policymakers most often identify vision as "the" test for retesting. They refer to data that show state re-licensing requirements

involving a vision test are associated with fewer fatal crashes for older drivers. It is important to note, however, that a study conducted in 1995 was unable to successfully conclude that vision tests required for seniors only were associated with lower fatal crash rates (Levy, Vernick et al. 1995). Additionally, the capacity to see well is only one segment of the complicated relationships of driving abilities. States may require that a vision test be given upon each license renewal after a certain age instead of every two or three renewals, as is common in many states. Additionally, a shorter period of license validity is also widespread because it gives the states more frequent control over an individual's license. These tools are also less likely to receive criticism regarding age discrimination because they are fairly simple and do not require further testing.

Cognitive function is another crucial element to driving. Knowledge and reflexes are equally critical. Perhaps the most confounding, and the most important and difficult of all to assess, is judgment. Unfortunately these are extremely difficult to acknowledge with state regulations, and according to many licensing officials the primary test used still remains "how you look coming through the door" (Coley and Coughlin 2002). While not such a scientific method, many states are reluctant or unable to press further restrictions. Unfortunately, the effectiveness of knowledge testing may not be adequately known or understood. Most tests do not have the ability to link a relationship between driving knowledge and later driving ability because they are not psychometric (Waller 1988).

Although vision tests are the most often discussed test for older drivers, they are neither easily passed nor implemented. Nor are they demonstrated to be necessarily linked to driving performance (Waller 1988; Levy, Vernick et al. 1995). For example, in Connecticut where vision tests are now age-based, the debate to pass the legislation was hotly contested and stalled for many years. Even upon passing the new law, the actual funding and implementation of the law took significant time (Coley and Coughlin 2002). Unfortunately, once tests are required and put into law, they might still not be implemented thoroughly. As the organizations responsible for maintaining drivers licenses are poorly funded, at least two states have indicated that while vision testing is on record as required, they do not have the fiscal ability to test applicants. The specific regulations and requirements from each state are discussed in the following section.

Older Driver Re-Licensing in the 50 States

To demonstrate the variation and diversity of state laws a baseline of driver re-licensing regulations in each of the 50 states was developed during the calendar year 2001. This baseline, available in Appendix A, provides an overview of the state re-licensing policies governing older drivers.

Within the realm of driving regulation policy the definition of old is extremely variable. The youngest age at which a state alters driving privileges is 50, while the oldest age is 75. The former is set by Oregon (with mandatory vision tests every eight years), and the latter by several states. The states requiring changes at specific ages begin with Oregon at age 50; Arizona, Colorado, Kansas, Maine, Nebraska, Pennsylvania at 60; California, Delaware,

Iowa, Louisiana, and Missouri at 70; Hawaii at 71; and finally the District of Columbia, Indiana, Illinois, Montana, New Hampshire, and New Mexico at 75. This variation reveals how uncertain state policymakers are in their understanding of what is an older driver (Coley and Coughlin 2002).

Uncertain Technology and Older Driver Testing

Currently, 18 states impose restrictions upon older drivers, and the principal restriction is a shorter duration of the valid license period. Time between tests is the nominal approach used by those states that do regulate based upon age. The state-level review compiled covers the basic functions associated with a driver's license – the length of time for which the license is valid; the ways to renew a license; any type of physical, vision, or mental testing required; and the specific visual ability required to have a driver's license. The length of time for a license to remain valid varies greatly among the states (Coley 2001; Coley and Coughlin 2002). The current renewal conditions describe the steps involved for a person to renew his or her license upon its expiration by state.

Physical testing refers to any type of test that one must take to renew his or her license, but this category does not include assessment of mental competency. This type of testing may be either a knowledge test (written, sign recognition) or an ability test (driving, vision, hearing). Knowledge testing determines the knowledge of traffic rules and what responses are appropriate during certain road situations (Cobb and Coughlin 1997). Vision testing refers to the standard eye test that most states require for an initial license and/or upon renewal. Lastly, the vision requirements (acuity and peripheral) refer to the visual ability of the driver including the horizontal field of vision someone must have to receive and maintain a driver's license in each state, respectively. Mental testing refers to any test that could reveal a condition that would make someone unfit to drive, such as periods of lost consciousness or instability (Coley and Coughlin 2002).

A study completed in 1997 found that only 11 states were mandating age-based renewal requirements, indicating that states are feeling more pressure to make changes that attempt to promote older driver safety (Cobb and Coughlin 1997).

License Length and Renewal Conditions

Driver's licenses are valid for a period ranging from four to five years in 39 states. A few states allow licenses to be valid for six or as many as eight years, usually depending on the driver's age. Arizona's original license is valid from issuance until the driver turns 65. As can be found in Appendix A, Idaho, Montana, New Mexico, New York, and Oregon allow some licenses to remain valid for up to eight years. (North Carolina provides some eight-year licenses while in transition to a five-year license.) Tennessee and West Virginia are also in a state of transition allowing up to seven-year licenses until they all return to five-year licenses. States providing licenses of six years include Florida, Hawaii, Kansas, Maine, Missouri, and Texas. Texas is also in a state of transition during

which a license may be valid for four, five, or six years until January 2002, when all licenses will be valid for six years (Coley and Coughlin 2002).

The 11 states that mandate a shorter license length as the driver ages include Arizona (age 65), Hawaii (age 71), Illinois (age 81), Indiana (age 75), Iowa (age 70), Kansas (age 65), Louisiana (age 70), Maine (age 65), Missouri (age 70), Montana (age 75), and New Mexico (age 75). These locations generally require a license length of one or two years at this age (Coley and Coughlin 2002). It is important to note, however, that although Illinois begins shortening license periods at age 81, a driving test is required at age 75.

With a shorter license length, states are provided the option to stay more informed of the changes occurring in individuals over the years. While someone might be perfectly capable of driving at age 80, when the license expires at age 82 he or she might have experienced some changes that adversely affect his or her driving abilities. In this case, if the license had been valid for four years the driver might have been unsafe and on the roadways for a longer period of time. While this is by no means always the case, enough evidence has convinced 11 states to alter the length of their licenses for older people (Coley and Coughlin 2002).

Physical and Mental Testing

Certain states require more frequent vision tests or other physical tests as a driver ages. As previously mentioned, physical testing includes any type of driving test, written test, or oral test. Mental testing describes any type of requirement that the driver be tested for mental and cognitive function to determine if he/she has the appropriate mental status to drive.

Vision Requirements

Vision testing is required in all states for original licenses, but later, states vary on the matter of whether further vision testing should be required. Eleven states – Alabama, Connecticut, Kentucky, Mississippi, New Jersey, Oklahoma, Oregon, Pennsylvania, Tennessee, Vermont, and West Virginia – do not require renewal or periodic vision testing, and of these only Connecticut and Oregon require periodic vision testing after a certain age, 65 and 50, respectively (Coley and Coughlin 2002).

Visual acuity requirements vary broadly, but typically nothing less than 20/60 (often with corrective lenses) passes and allows a non-restricted driver's license. Peripheral requirements vary widely throughout the United States, and some states have no peripheral requirement for a regular driver's license. Many of the telephone representatives contacted in this study did not know the exact requirements for the peripheral vision and some were unable to provide this information. One indicated that there were no requirements for vision other than passing the vision test. Most websites do not contain such detailed numbers, because the vision tests given on-site usually tell the licenser if the driver has passed or failed the test, not what his/her actual vision is compared to the requirement (Coley and Coughlin 2002).

Knowledge, Road and Medical-Based Testing

Only 14 states have a procedural system that requires knowledge or road testing while the driver maintains a valid license. Either the state tests (1) with

each renewal, (2) if the driver has received any motor violations since the last renewal, or (3) if the examiner feels the person should be further tested. Knowledge or driving tests are required in the case of an expired license by only four states. Physical tests for most areas are required only in cases of a new driver's license, which for most people is obtained as a teenager (Coley and Coughlin 2002). Road testing is expensive and time-consuming, and administrators, testers, and licensees make every attempt to avoid a road test beyond the initial test (Waller 1988).

Physical testing requirements and standards are highly variable among states. In the District of Columbia, a driver older than 70 must submit a doctor's report upon renewal, and a mandatory re-examination is required for any driver over the age of 75. Idaho requires a written test every eight years and a road test if the examiner feels that the applicant might have difficulty driving. Illinois requires a driving test for those over the age of 75, though the test may be required of persons younger than 75 as well. Testing in Iowa is also determined at the discretion of the examiner if a physical or mental problem is thought to be possible with the applicant. Kansas requires an open book written test with each renewal (Coley and Coughlin 2002).

While Louisiana does not require any changes if the licensee has been a resident of Louisiana, someone applying for a first license who is aged over 60 years must submit a doctor's report about his or her vision and physical condition. A written test is required for renewal in Michigan, and a road test is required if the license has been expired for more than four years. Missouri requires a sign recognition test for each regular renewal. Tests in Nebraska are determined at the discretion of the examiner. Nevada requires a written test if the licensee has received three or more tickets in four years and a driving test with six or more tickets in four years. New Hampshire requires a mandatory license re-examination-driving test for anyone over the age of 75 (Coley and Coughlin 2002).

New Mexico requires a driving and written test if the license has been expired more than one year. A sign recognition test is required for renewal in North Carolina and further testing is required of anyone convicted of a traffic violation since the last license was issued or the license has been expired more than one year. Similarly, Ohio requires a written and road test if the license has been expired for more than six months. South Carolina requires a knowledge test if the driver has received more than five points in a two-year period. Re-examination is required in Washington State only if merited by a physical or mental condition. Wyoming tests for skills once in an eight-year period at the discretion of the examiner. Most other states allow someone to continually renew his or her license through the years providing (in most cases) that the driver's vision remains intact (Coley and Coughlin 2002).

Mental Testing

No state requires a mental or competency test for anyone at a certain age. States that require a doctor's visit usually do so at the discretion of the examiner. Sometimes the criterion for testing is determined by the appearance of the licensee upon arrival at the examination office. One state respondent indicated

that if someone could cope with the re-licensing examiner he or she would possess all the mental facilities necessary to drive. Several states, including Colorado, Florida, Maine, Maryland, Michigan, Missouri, Montana, Nebraska, and Utah specifically pose questions regarding medical history or current health upon license renewals. Georgia, Hawaii, Utah, Virginia, and Wisconsin indicated that they require a mental-health examination if a notification is received from a doctor, police officer, or relative of the driver-in-question. Most departments contacted indicated that they did not require any type of mental examination, but most likely anyone who attempts to renew a license in person who does not appear mentally competent to drive would be examined or questioned further (Coley and Coughlin 2002).

While a mental disease could be detrimental to anyone behind the wheel, most states feel that they would be able to assess any problem by sight. The system is designed to expect drivers to answer questions regarding their mental state truthfully, and that license examiners are adequately trained to identify and respond to a potential problem (Coley and Coughlin 2002).

If a driver, of any age, has a physical or mental impairment that may affect safe driving, most states have a medical review board in one form or another, though their effectiveness has not been evaluated, most likely because of the many differences between them (Waller 1988). These medical review boards will be discussed in more depth in Chapter 4.

Institutional Capacity and Implementation Problems

Political debate may be fueled by passionate values and emotions, but the sustainable driving force of any policy debate is often the attractiveness of readily available, acceptable and affordable solutions (Rochefort and Cobb 1994). Unfortunately, in the case of older driver re-licensing there is a dearth of attractive solutions. However, even if policy consensus could form around an age and a test – how would it be effectively and efficiently implemented? Most state testing agencies barely have the institutional capacity to accomplish the goals they have today. Most new testing methods would require large capital outlays, training of personnel and physical changes to facilities. Such changes require increases in budgetary and personnel authority. Each of the driver testing bureaus must compete with other agencies and issues for budgets, people and power. Driver licensing – for any age – rarely achieves agenda status in when confronted with other policy problems such as education, health and crime (Coley and Coughlin 2002).

In fact, for most people, the local Department of Motor Vehicles (unfair as it may be) is the department they love to hate. Waiting times to renew (and receive first) licenses are often very long, office hours may be short, and offices may be far apart. Even if new tests were desired for older drivers, the licensing agencies attempt to provide expeditious service, and more elaborate re-licensing requirements would lengthen the wait time of customers (Janke and Eberhard 1998). Few members of the public, and therefore elected officials, are eager to extend the resources, range of authority and responsibilities of these organizations, because increased requirements would potentially raise taxes and waiting times for visits to obtain and renew licenses (Coley and Coughlin 2002).

The diversity of regulatory strategies governing older driver re-licensing throughout the nation reflects an on-going and emotional debate triggered by periodic and local events. However, it is also indicative of a fragmented approach – not only to driver re-licensing – but to transportation in general. Diverse as they may be, the combined policies of the states represent a questionable national approach to mobility for older people, one that is for now mired in a debate over the definition of "old" and the "best test", instead of addressing how to best support the transportation needs of people throughout their lifecycle (Coley and Coughlin 2002).

While some of the state laws attempt to regulate the older driver with respect to license terms, many older adults regulate themselves. The methods older drivers use to self-regulate are discussed further in Chapter 4.

4

4: Self-Regulation: The Older Driver

Definition of Self-Regulation

When discussing human behavior, it is important to understand the definition of self-regulation. One definition describes self-regulation as "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman 2000). There are many models of self-regulation discussed in literature, of which one discusses self-regulation from a social cognitive perspective. This model describes self-regulation as an interaction of three processes: personal, behavioral, and environmental. This simply means that personal knowledge may be used to enact behavioral skills that then manage environmental occurrences. The three work together albeit often unconsciously to collectively compose what some researchers consider to be the regulation of oneself (Zimmerman 2000). In fact, some research indicates the possibility that self-regulatory behaviors are mostly unconscious, while the conscious behaviors are those of self-control (Kuhl 2000).

Self-regulation is often considered necessary for the obtainment of personal goals, such as the cessation of smoking or losing weight. According to Zimmerman, self-regulation is a *process* rather than a state or a trait. This research also indicates that self-regulation occurs in three, cyclical phases: forethought, performance or volitional control, and self-reflection (Zimmerman 2000). While each phase is distinctively separate, this model assumes that the feedback from prior performance may be used to adjust efforts, allowing one to proactively raise goals and seek more challenging tasks. As people move through each phase, which is necessary because the personal, behavioral, and environmental factors are constantly changing, they have the opportunity to use internal or external feedback to make decisions about how or what to regulate. The phases are described in Table 1.

Table 4.1: Phase Structure and Subprocesses of Self-Regulation

Cyclical self-regulatory phases		
Forethought	Performance/volitional control	Self-reflection
Task analysis Goal setting Strategic planning Self-motivation beliefs Self-efficacy Outcome expectations Intrinsic interest/value Goal orientation	Self-control Self-instruction Imagery Attention focusing Task strategies Self-observation Self-recording Self-experimentation	Self-judgment Self-evaluation Causal attribution Self-reaction Self-satisfaction/affect Adaptive-defensive

Source: (Zimmerman 2000).

As shown in Table 1, the forethought phase, which refers to influential processes that occur before actions, consists of task analysis and self-motivational beliefs. Task analysis most commonly occurs as the setting of goals and planning required for attainment of desired results. At this point strategic planning also occurs around the methods appropriate for the goal (Zimmerman 2000).

Also instrumental in the forethought phase are the beliefs one must have to motivate the self. One must have certain expectations of the results of the action required, as well as becoming familiar with the goals. Without these beliefs that one may accomplish the task at hand the goal will not be attained. Self-efficacy, or a person's judgment of the ability to reach a specific goal, works with outcome expectations, which are beliefs about the final results of the regulation. For example, self-efficacy refers to the belief that one will lose weight, and the outcomes refer to the expectations about the consequences this weight loss will produce later, such as lowered cholesterol and a reduced risk of heart disease. One will remain more dedicated to the goals if the self-efficacy beliefs are strong. Intrinsic interest occurs with time, as outcome rewards become milestones for future goals. Additionally, goal orientation may assist to sustain motivation. The power of positive thought is important for self-regulation (Zimmerman 2000).

The second phase of this model is that of performance or volitional control, which consists of self-control and self-observation. The processes of self-control involve self-instruction, imagery, attention focusing, and task strategies, all of which promote task focus and ways to optimize efforts. Self-instruction refers to a description of how to continue as one executes a specific task, such as how to maintain one's current weight. The verbalization of how to solve problems may improve one's ability to actually find a solution. Imagery may create better results if a successful execution of performance is imagined. This is often used within the sports community (Zimmerman 2000). The aim of

attention focusing is to improve concentration on the task, for example by ignoring distractions and avoiding fixation on past mistakes. Task strategies subdivide a task into manageable parts and reorganizing them in such a way as to improve results (Zimmerman 2000).

The self-observation process consists of tracking one's progress in the regulated behavior, as well as surrounding conditions and effects produced from the behavior. Self-recording involves the physical recording of events, such as the food eaten in the days preceding a migraine headache. This may allow the sufferer to identify certain triggers to avoid in the future. The amount of information obtained may overwhelm naïve self-observers and lead to disorganized monitoring. Timely monitoring during this process is crucial because if delayed, the observer may miss opportunities to correct behavior. The amount of information obtained in performance feedback is important to the options one sees for change. For example, practicing a skill in a controlled setting may enhance the information, as when track runners practice on an official track, observing what changes in technique increase their speed. Misrepresented observations create an atmosphere in which corrections may not be made appropriately, making the goal more difficult to obtain. Self-recording may be more useful when observing accomplishments, because focusing on the problems may create a negative atmosphere which is difficult to overcome (Zimmerman 2000).

Self-observation also involves experimentation with methods used or contexts of behavior, such as the changing the situations and environments in which a smoker trying to quit feels the urge to smoke. Through experimentation one may understand better ways to achieve control over behaviors and reach desired goals (Zimmerman 2000).

The self-reflection phase consists of two processes: self-judgment and self-reaction. Self-judgment involves the evaluation that compares what has happened with the standard or goal to determine how much more effort is needed to reach the goal. For example, an athlete may compare practice efforts with personal bests to determine current performance. People evaluate themselves using different criteria, including mastery, past performance, normative, and collaborative. Mastery may allow one to determine progress based on levels from novice to expert. Past performance allows a judgment of success comparing current behavior to that of the previous gold standard. Normative judgment compares the self with behaviors of others, which may lead to complications in drawing attention to social factors instead of internal factors. Collaborative judgment defines success usually within a team setting, where each member uses different criteria to determine a job well done, but everyone succeeds or fails depending on how well each member works within the team (Zimmerman 2000).

Self-reactions refer to the thoughts or conclusions about how to change a specific behavior in order to learn or perform. They may be adaptive, which lead people to shifts in goals or strategies, or defensive inferences, which operate to protect one from discontent and undesirable feelings. Among defensive inferences include helplessness, procrastination, task avoidance, cognitive

disengagement, and apathy. Self-reactions may determine how well one continues along the course of action for the desired result or self-regulation (Zimmerman 2000).

Success (or failure) within self-regulation may be determined by several characteristics. It is important to remember that social and environmental factors directly affect these three phases. Key developments within the social or environmental spheres may create failures in addition to other problems. Obviously, the inability to correctly participate in the three phases will lead to an inability to self-regulate. For example, the inability to set reasonable goals will lead to poor results in the self-observation process, which may will then lead to poor self-judgment, and then back to poor self-efficacy, ultimately creating lower intrinsic interest at which point the subject may lose all desire to self-regulate. Within this context there are several forms of dysfunction, usually due to ineffective forethought and performance control techniques. Poorly regulated individuals typically utilize reactive methods to achieve desired outcomes, such as eating very little following a weekend of binge eating. This type of method fails to produce results because they ignore goal structure, appropriate planning, and self-efficacy necessary to progress in a timely manner. Without specific progress goals or baseline information people rely upon social standards and when unable to attain long-term goals quickly, they lose intrinsic interest (Zimmerman 2000).

According to Zimmerman (2000), "a lack of social learning experiences is the first important source of self-regulatory dysfunctions." When children are not taught appropriate self-regulatory skills they will not fully develop those skills necessary as adults. Additionally, a lack of interest in the desired result leads to many failed opportunities for self-regulation. When a specific skill is not valued within society, an individual feels no need to self-regulate (Zimmerman 2000).

Some researchers look to determine how people create actions from intentions and desires (Carver and Scheier 2000). They believe that behavior is designed with the goal in mind, and then controlled with feedback, as explained by Zimmerman (2000). According to others, the key to any successful self-regulation is to have both positive and negative feedback loops. Positive feedback looks lead to change, growth, and development, while negative feedback loops create a stable state maintained by keeping parameters within attainable limits. If one receives only negative feedback, a system will remain stagnant, but a system receiving only positive feedback will suffer a cataclysmic explosion. The positive feedback loops change everything that without any feedback to provide a stable existence, the system will no longer function (Shapiro and Schwartz 2000). For example, a driver who is attempting to use self-regulation with regard to driving behavior must receive both positive and negative self-feedback regarding driving performance. This will enhance the self-regulation performance and provide the driver an opportunity to improve behavior or driving habits.

Driving and the Self-Regulation Decision

Self-regulation often refers to the attainment of goals such as smoking cessation and weight loss, related to the habits of smoking and eating. For the

purpose of this discussion, self-regulation will be related to driving, which is a skill, very different from a habit. Typically the outcomes of dieting and smoking cessation are considered positive benefits, while the outcome of driving avoidance and cessation usually feels negative with the associated reduced mobility. When driving behavior in older adults is considered, it is primarily thought of in terms of avoidance of certain situations or conditions, which often leads to driving cessation. Research has uncovered many reasons that older people begin to regulate their driving behavior, which can sometimes be an unconscious decision. This personal dynamic exists and therefore supports the goals of public policy that currently governs traffic safety, as the regulators are so resistant to affect change.

Ways in Which Drivers Self-Regulate

Drivers manage to self-regulate through the situations in which they choose to drive as well as the number of times they choose to take trips. This process is usually a gradual change in behavior experienced over several years (Persson 1993). Older drivers are known to avoid certain conditions, such as night driving, high traffic highways, in rush hour, in the rain, and driving alone (Persson 1993; Ball, Owsley et al. 1998). Ball et al. (1993) indicate that deterioration in visual and cognitive processing usually leads to fewer days of driving per week, implying that self-regulation is not only manifested through avoiding the previously mentioned situations, but also through a reduction in other facets of driving (Ball, Owsley et al. 1998).

Why Self-Regulate?

Many circumstances lead older people to regulate their driving behavior. All drivers make decisions every day about when to drive, and when not to drive. With older adults these decisions happen more often, with more thought regarding the driving surroundings. One study of drivers over age 55 concluded that avoidance behaviors were observed more often in people with visual and/or cognitive impairments and eye health problems. Drivers were said to "self-regulate their driving in that they avoid driving in situations which are more challenging" (Ball, Owsley et al. 1998). Reasons to self-regulate and avoid driving can be medical, physical, and social (Marottoli, Ostfeld et al. 1993; Ball, Owsley et al. 1998; Hakamies-Blomqvist and Wahlstrom 1998; Dellinger, Sehgal et al. 2001). Some of the medical illnesses that could cause a driver to self-regulate are explored in the Persson (1993) research, and are shown in Table 2.

Table 4.2: Illnesses Present in Participants that Interfered with Driving (N=56)

Illness	Percent (%)
Arthritis, rheumatism	13
Cataracts	9
Macular degeneration	9
Glaucoma	7
Heart trouble	7
Effect of Stroke	7
Stomach/intestinal disorders	4
Urinary tract disorders	4
Nerves	4
Circulation trouble in arms/legs	2
Liver disease	2
Anemia	2
Skin disorders	2

Note: Participants could choose more than one response; percentage does not equal 100.

Source: (Persson 1993)

As shown in Table 2, there are a variety of medical conditions that affect a person's decision to avoid driving. The most common response, arthritis, could make simple tasks such as gripping or turning the steering wheel very painful. Difficulties with cataracts could make the roadway too difficult to see clearly at night, so drivers with this problem might self-regulate by only driving during the day. Most of the medical problems in this table are common to older adults, and play a role in daily driving decisions.

Physical conditions causing the avoidance of certain driving situations may or may not be also considered medical conditions. Some examples of these conditions may be changes in visual or hearing capacities, arthritis, and amputation (Marottoli, Ostfeld et al. 1993).

Social factors may also factor into the decision to avoid or stop driving. These may include the economic cost of owning a car, lowered income with retirement, and the lifestyle of retirement itself in which one no longer needs to commute to work on a daily basis (Marottoli, Ostfeld et al. 1993).

Interestingly enough, although many older drivers indicate that they self-regulate driving behavior because of fear and lack of self-confidence, a study conducted in 1998 found that "all participants rated themselves as being average or above average drivers compared to others their age, with the majority rating

themselves as being above average" (Marottoli and Richardson 1998). Most older drivers tend to overestimate their driving skills (Young 2001).

At some point many people consider (though not necessarily consciously) the option to not renew their driver's license. Driving cessation is the most severe case of driving avoidance, as drivers self-regulate themselves into no longer driving at all (Ball, Owsley et al. 1998). A study conducted in Finland indicated that less than one percent of people who did not renew their licenses did so for reasons specifically related to the renewal process, leading to the conclusion that reasons for driving cessation were related to other issues (Hakamies-Blomqvist and Wahlstrom 1998).

Medical problems were cited by 41 percent of a study completed in Southern California as the main reason they had stopped driving (Dellinger, Sehgal et al. 2001), and Hakamies-Blomqvist and Wahlstrom (1998) noted that glaucoma, depression, and neurological disorders were the most commonly noted decisive factors. Additionally, sensory impairments (particularly those that affect vision), medical conditions, advice from a family member, loss of insurance, and failure to renew a driver's license are common factors linked to the decision to stop driving. (Gilhotra, Mitchell et al. 2001; Young 2001)

Persson (1993) also studied the cessation of driving by elderly people and noted that the decision was most often made with great reluctance. Table 3 displays the reasons that the participants stopped driving by percentage.

Table 4.3: Reasons for Driving Cessation Given by Elderly Participants (N=56)

Reason	Percent (%)
Advice from doctor	27
Increased nervousness behind the wheel	20
Trouble seeing pedestrians and cars	20
Medical conditions	18
Advice from family/friends	16
Difficulty in coordinating hand/foot movement	9
Transportation provided by retirement center	9
Cost of upkeep/age of vehicle	7
Involvement in minor accidents	5
License revoked	4

Note: Participants could choose more than one response; percentage does not equal 100.

Source: (Persson 1993)

As shown in Table 3, the most common reason that the subjects ceased driving was that they had received advice as such from a doctor, although only

32 percent of participants' physicians had ever raised the topic. The most common doctor to mention the subject was an ophthalmologist (Persson 1993). Other reasons that people stopped driving included nervousness, advice from family and friends, and minor accidents or license revocation. These ultimately lead to two major ways in which people stop driving: gradual avoidance behavior or (to a lesser extent) a sudden and potentially disabling event (such as a stroke) (Persson 1993; Dellinger, Sehgal et al. 2001).

Special Roles of Families and Physicians

Physicians have an important and unique relationship with older drivers. They are in the position in which they may be monitoring health and fitness conditions of their patients over the years, or they may see a patient once every few years. Physicians are provided the opportunity to be involved in the decision to reduce or cease driving through providing accurate and timely feedback (Dellinger, Sehgal et al. 2001). Unfortunately sometimes the physician does not know enough about a patient's condition (excepting the medications and other illnesses such as dementia) to determine accurately whether the patient should continue to drive. Even with full knowledge of a patient the physician may not be able to adequately assess an individual's driving capabilities (Johansson, Bronge et al. 1996; Marshall and Gilbert 1999; Berger, Rosner et al. 2000).

Many physicians do not even know the requirements for reporting a potentially impaired driver, and when they do many are reluctant to do so. One study found that only 30 percent of geriatricians did not know the state requirements for how to report a patient to the Department of Motor Vehicles (Cable, Reisner et al. 2000). Only 58 percent of physicians in Canada noted they would report a patient whom they believe to be medically unfit to drive, though 92 percent of United States geriatricians noted they would report such a patient (Marshall and Gilbert 1999; Cable, Reisner et al. 2000).

Most states provide policies in which reporting by physicians is voluntary, but as of September 2000, only Delaware, New Jersey, and Nevada require mandatory reporting for patients with epilepsy, and California and Utah also mandate reporting of dementia and other possible cognitive impairments (Berger, Rosner et al. 2000). In order to streamline and provide a well-organized process for reporting, medical advisory boards were created and are available in most states (Berger, Rosner et al. 2000). As mentioned in Chapter 3, these boards are generally staffed by agency personnel, sometimes with a full-time physician, or volunteer physicians that meet periodically. These bureaus review special cases referred to them by examiners, physicians and law enforcement. Although these medical review boards are crucial to identify impaired drivers of all ages, their level of activity and efficacy varies widely across the nation. Selected states reported that their medical review board had not met for more than a year while others have institutionalized their work within the agency (Coley and Coughlin 2002).

Unfortunately, there are no nationally accepted guidelines for physicians to help and counsel older drivers (Dellinger, Sehgal et al. 2001). Just as the state licensing laws lack cohesion regarding the testing and re-licensing procedures for older adults, there is no unified national approach to help older

people identify when and how they should self-regulate with regard to driving. As many as 97 percent of Canadian physicians surveyed indicated they would prefer some type of continuing medical education to promote knowledge of medical fitness to drive (Marshall and Gilbert 1999). Additional training within the realm of recognizing the factors that could contribute to impaired driving could assist the physician with a decision to report a patient or to avoid doing so (Marottoli 2000).

In the Hakamies-Blomqvist and Wahlstrom (1998) study, of the drivers who had given up driving altogether, about seven percent of the ex-drivers had been advised by a physician to stop driving. In about 11 percent of known settings the drivers were advised in accordance with the obligatory health control procedures for licensing in Finland (Hakamies-Blomqvist and Wahlstrom 1998). While a physician is generally well respected, the suggestion to stop driving might be met with resistance. One study found that participants believed that the physician should be the person to discuss driving with the older individual, and if advised to stop driving (and supported by family members) they would turn in the keys (Persson 1993).

The National Highway Traffic Safety Administration, or NHTSA, completed a report (2001) that discussed the desires of family and friends to intervene when an older driver should be cautioned to reduce exposure. The report concluded that support was often lacking (though desired by family and friends) of physicians, the police, the Department of Motor Vehicles, and lawmakers. Interestingly, the physicians did not always agree that the problem was very serious. The report also indicated that physicians (in addition to police and others who promote traffic safety) need to be informed about how to: recognize impaired drivers, assist family members in interventions, support legal efforts to remove unsafe drivers from the road, and advocate for public safety when independence and mobility becomes a threat to others (National Highway Traffic Safety Administration 2001).

Another difficulty with physicians advising patients and reporting medical conditions to advisory boards is that of the doctor-patient relationship. Legal definitions of what is required (and ethical) are often blurred, and a physician risks losing a patient upon filing a report to the medical advisory board (Persson 1993). Certain conditions are easy to use as reasons to stop driving (such as advanced dementia), but in other cases the line is much less clear. If a doctor only sees a patient once a year, cognitive problems of the patient may not be very obvious. Additionally, a standard medical examination alone is not sufficient to predict increased crash risk; a cognitive examination must also be included (Johansson, Bronge et al. 1996). As mentioned, many physicians are hesitant to report potentially impaired drivers, most likely due to a widespread belief that the doctor-patient relationship is damaged when the physician reports a patient to the local authorities (Marshall and Gilbert 1999). Reporting could lead to an avoidance of health-care services by older adults, out of fear that the physician might report them as potentially unfit drivers (Berger, Rosner et al. 2000)

Gender Differences in Self-Regulation

Gender differences are frequently noticed in decisions to regulate or cease driving (Jette and Branch 1992; Marottoli, Mendes de Leon et al. 1997; Coughlin and Tallon 1998; Hakamies-Blomqvist and Wahlstrom 1998; Young 2001). Although the Hakamies-Blomqvist and Wahlstrom (1998) cohort studied consisted of low licensing rates for women, females tended to stop driving more often than men. While men usually stopped driving due to health reasons, the most frequent reason for the women to fail to renew their license was that they had previously stopped driving anyway. The study also found that women participated in avoidance behavior and experienced more stress while driving than men. Young (2001) noted that women are more likely to observe deficits that may impair driving, and then choose to self-regulate, that is to limit driving or cease driving altogether. Dellinger et al. (2001) found that driving cessation did not vary by gender (with regard to miles driven before stopping, number of medical conditions or crashes in the past 5 years) but the study did find that the *reasons* behind the cessation were different for men and women, with women reporting licensing problems, financial burden imposed by the car, and availability of someone else to drive them.

Travel patterns of men and women vary, and as found in the study by Taylor et al. (2001), women are more likely to be dependent on others for transportation solutions. Less than half of the women studied depended on their spouses for transportation following license revocation, while two-thirds of the men depended on their wives. While reasons behind these statistics could be various, the data nonetheless suggest that the impact of license revocation could be greater for men than women. Men are more likely to be the drivers, and are the most likely to continue using the car as the primary transportation mode. This is directly correlated with the fact that women are less likely to drive and among those who do tend to drive fewer miles overall (Jette and Branch 1992; Marottoli, Ostfeld et al. 1993).

Currently, men continue to be much more likely to be drivers (as opposed to non-drivers) than women (Chipman, Payne et al. 1998). As lifestyles continue to change and evolve, women have begun working more, and enlarged their spatial sphere from which they operate (Bush 2001). Older women in the future are expected to drive more than elderly women currently, and most likely gender differences in driving cessation will be reduced with the increase of drivers among successive cohorts of women (Hakamies-Blomqvist and Wahlstrom 1998).

Promoting Self-Regulation

Education plays a crucial role in the decision to self-regulate. In this case, education refers to the type of driver education that may be found in programs such as AARP's 55 Alive program (AARP 1995). This type of program is designed to provide information to older drivers that could help them be safer, more defensive drivers. Through this kind of educational measure, older drivers could learn about ways in which to self-regulate to keep them away from dangerous or difficult situations, such as rush hour or nighttime driving.

Role of Education in Attitude Change

An educational program could be designed to change the behaviors of older drivers through the phases of self-regulation found in Table 1. While all of the phases may not be applicable in the driving situation (as driving is more a skill than a habit to break such as smoking or eating), some of them are certainly processes that older drivers could train themselves to use regularly. Older drivers could set goals and strategically plan, for example, by deciding that they would attempt to make only right-hand turns, and then set a route based on this goal. Through self-observation drivers could determine if the self-regulatory practices seemed to be taking effect and were beginning to become involuntary, such as not driving at night because it is habit, not because of a conscious decision to avoid driving when it is dark. Through self-judgment the older driver may be able to compare behavior to that of other older drivers to determine how well the self-regulation changes driving skill with regard to others, though purely on a qualitative basis. The phase that could be the most useful for the older driver is that of forethought. When the driver is aware of the choices available regarding driving situations, thought processes change regarding driving times and situations in which he or she will drive.

They key to successful self-regulation with regard to the older driver is the role of intention (seen most commonly in the forethought phase). For the purposes of this discussion, intention focuses on a purpose and direction, but not a single goal. Shapiro and Schwartz (2000) indicate that intention leads to attention in behavior leading to connection with the regulation, all of which lead to the desired result (such as driving less during difficult situations) and back. Having the conscious intention to self-regulate driving behavior may lead to increased safety for an individual by resulting in a desired outcome such as driving less during stressful situations.

Benefits of Self-Regulation

Once an older driver realizes the benefits of self-regulation with regard to driving, it is possible to reduce the safety hazards on the road. This may be accomplished with simple maneuvers such as scheduling trips during the day instead of at night or making several right turns instead of one left-turn across oncoming traffic. The question remaining is how to encourage people to make these self-regulating behaviors and how to make people aware that these are safety options? Also, how might research encourage the view of older adults that driving avoidance may be a positive aspect in terms of safety promotion and reduced stress, instead of reduced mobility?

Self-regulation as a safety measure could have the strongest impact on those drivers who have moderate impairments, as they may self-regulate, keeping themselves off the road during situations that might be exceptionally difficult (Ball, Owsley et al. 1998). Unfortunately, no clear picture exists that can accurately determine the risk posed by drivers who have ceased driving, so it is unknown how much of a safety benefit has been realized by the drivers who have moved from driving avoidance into cessation.

One study was designed to determine the effectiveness of one-on-one educational programs for visually impaired drivers in promoting behaviors of self-regulation, primarily through avoiding hazards and reducing the number of hours on the road (Owsley, Stalvey et al. 2002). The goal of this type of educational programs is to promote self-regulatory behaviors in order to prevent crashes before they happen. Results indicated that people who received the education engaged in more self-regulatory behaviors and avoided hazardous driving situations more often.

While elderly drivers may reduce the frequency of driving and even cease driving altogether, they typically resist any change in the preferred mode of travel over time, and even expect to travel by the same mode (Jette and Branch 1992; Taylor and Tripodes 2001). Often times, reliance on the automobile by elderly is unrelated to a person's health, and more likely a social phenomenon. One study noted, "the predictors of who gives up driving a car suggest that self-regulation was being used," though the success of such regulation is likely to depend on the availability of alternative travel patterns and modes to the elderly driver (Jette and Branch 1992). Taylor and Tripodes (2001) observed no increase in alternative modes of transportation including fixed-route public transit, flexible paratransit services, taxis, or walking after the drivers license was revoked, though the study consisted of drivers with dementia who had lost licenses, and other modes can be very difficult for people with advanced stages of dementia.

The success of self-regulation as a strategy for promoting safety, while having potential to benefit some drivers by decreasing exposure to dangerous or difficult situations, could depend entirely to the options available to people who are trying to reduce driving (Jette and Branch 1992). Without any alternatives available, many people (particularly in rural communities) find themselves forced to drive even when they would prefer to find another solution. Again, while self-regulation may or may not sufficiently reduce crash risk, it may be less expensive than interventional programs designed by the government, especially when considering the budgets of the State Departments of Motor Vehicles and the options currently available for restricting older drivers.

As the nature of driving cessation is often gradual and spontaneous, research should focus on screening devices that may accurately predict a driver's abilities, along with methods to support the complex decision-making regarding driving cessation (Hakamies-Blomqvist and Wahlstrom 1998). Part of the difficulty in judging self-regulation for all elderly persons is the ease or difficulty with which a driver may have in reducing or modifying driving. The individual who decides to stop driving must have alternative transportation methods in order to maintain mobility (Persson 1993; Marottoli, Mendes de Leon et al. 1997; Chipman, Payne et al. 1998). If no acceptable alternatives exist, it will be more likely that the impaired driver, assumed to be at high risk because of age or disease, will continue to drive.

Unanswered Questions Regarding Self-Regulation

The previous sections have highlighted the issues that surround the topic of older drivers and how they choose to self-regulate. The focus of this research was then structured around determining the dynamics of informal public policy

that currently exist. Ultimately, such questions include what are older adults doing to modify behavior, why are they choosing to do so, do they realize that they are changing behavior, are they losing something integral to the driving or life experience, is this a sustainable way to continue addressing older drivers, and will older drivers of the future continue to modify their behavior in such manners?

Based on the reviewed literature, questions were brought forth regarding the behavior of older drivers and the consciousness of self-regulatory practices. These questions relate to the way in which driver education shapes and changes behavior, along with the current driving patterns of participants and how they have changed over the years. Additionally, the way in which self-regulation changes with age, the procedures in which older adults use to increase driving confidence/safety, the type of family conversations that should take place surrounding driving avoidance/cessation and the relationship to self-regulatory behavior, and the ways in which people have planned for not driving in the future were all identified as questions for research.

From a public policy viewpoint, it is interesting to contemplate the ways in which drivers compensate their driving behavior to remain safe when behind the wheel. While one study found that "primary prevention programs that promote self-regulation encourage drivers to engage in behaviors that will prevent crashes before they happen," further study should either confirm or disprove such research (Owsley, Stalvey et al. 2002). If older adults adequately self-regulate and remain safe drivers, then the public policy debate may be able to shift away from re-licensing requirements. If, however, drivers may *learn* how to adequately self-regulate through educational programs, the policy debate may be able to focus on ways in which drivers could be encouraged and even taught how to self-regulate, and the types of educational programs would most efficiently and effectively improve older driver safety. However, if older drivers are *not* self-regulating effectively enough and it is determined that they will *never* do so willingly, the debate over re-licensing requirements will need further study and pressure from stakeholders about the appropriate way in which safe drivers are rewarded, and unsafe older drivers are removed from the roads.

From a social psychology standpoint, understanding how and why older drivers' behaviors have changed over the years is crucial to the ability to predict driving behavior by older adults of the future. If older drivers avoid certain conditions due to a reason linked to upbringing and cultural influences, it is possible that in 50 years driving behavior and self-regulation will be totally and completely different than it is today. In that instance, it is possible that self-regulation will no longer be a tool that is appropriate for improving safety on the roads. It is also interesting to note the ways in which the drivers adapt to increase their confidence level while driving, and also to determine if a higher confidence level leads to safer driving or improved driving skills. If driver confidence is something that may be taught, future research could develop programs in which drivers would be able to learn how to be confident while driving.

Additionally, the discussions surrounding the decision to limit or stop driving are important to study because they could be developed in a manner in which families may be able to identify with changes in an older family member and the ways in which to encourage driving avoidance and cessation without alienation. Many families identify someone who should limit or stop driving, a mother, or father, or grandparent, for example. Often they do not discuss the problem with the family member until it is too late, if ever. They avoid this discussion out of fear of rejection and the belief that because the older person has been in charge of him/herself for so long that he or she should be thinking about this issue without meddling. Developing more resources for families could encourage people to engage in these types of discussions with ideas on how and when to approach the family member.

While identifying the ways in which drivers have planned for not driving in the future, researchers may be able to promote the ideas that seem to be the most feasible in the minds of older adults. For example, if many people indicate that they will continue to travel by car with another person driving, researchers may have the opportunity to think about redefining paratransit into a mode that will better suit older adults' needs. These issues are discussed further in Chapter 5.

5

5: Focus Groups Findings

Focus Groups as a Tool

Focus groups are a way for researchers to obtain information about people's opinions and thoughts within a group dynamic. They create a form of communication that allows researchers to find internal dynamics about why people do certain things, information that is not obtainable from a survey (Morgan 1998). Demand data sets could be useful but for research regarding self-regulatory practices of older adults, comprehensive data do not exist and would be extremely time-consuming and expensive to complete.

Focus groups may be very useful in collecting qualitative data that can be useful as a research method. (Morgan 1998) They provide information that is extremely focused and directed by the questions asked by the moderator. They consist of discussion among participants with the moderator asking the appropriate probe questions to guide the discussion along the desired lines. Sometimes this discussion may consist of topics that are very emotional to the participants, as was the case in those discussed here.

Three strengths may be associated with focus groups: 1) their unique opportunity to explore and discover, 2) their ability to maintain context and depth, and 3) their ability to provide interpretable information (Morgan 1998). Exploration may occur when people do not adequately understand the questions or topics discussed. For example, if the question refers to the most appropriate driving test, and then five tests are offered, people may only understand one or two of the tests. The moderator may need to explain the others in depth (Morgan 1998).

Context and depth allow researchers to understand the ways in which each participant may be similar or dissimilar to other individuals in the group, and also provide an understanding of perspectives (Morgan 1998). Participants may hear what someone else says and then be able to respond with a personal experience or anecdote.

Through focus groups researchers and participants may have the opportunity to understand each other and what can make two people who seem similar actually have very different experiences and thoughts. Through the discussions participants may find out more about each other and even themselves (Morgan 1998).

Focus groups provide the method in which researchers may delve into topics to determine ways to structure programs or experiences. Data regarding

driving preferences, self-regulatory behaviors, and internal feelings may not be adequately recorded in a purely numeric, scientific way, but that does not indicate that this information is invalid. Understanding *why* people modify their behavior may lead to conclusions about how to encourage such behavior or how to shape and change policy such that they do not need to make such decisions.

To be effective, focus groups must have a well-defined purpose focused on the researchers needs and interests (Morgan 1998). When the research has identified many questions that may be addressed, it is more efficient to utilize a focus group, rather than individual interviews. Through the individual interviews, researchers may learn a great deal of information about the specific participant, but through the focus groups the interviewer may learn a great deal more information regarding a few key topics about a particular subset of the population. Additionally, individual interviews would be extremely time-consuming and do not provide the dynamic of group interaction (Morgan 1998).

One of the most important benefits of a focus group is that of unconformity. When in a group setting, many differing opinions and thoughts may be shared. Fortunately, through a focus group, everyone does not have to agree, and may provide an interesting discussion around the point of conflict (Morgan 1998). Sometimes differing opinions may be shaped around gender biases, and focus groups provide an excellent way to view differences in behaviors and preferences of males versus females.

Focus groups were used to provide information regarding self-regulatory behavior experienced by older drivers within two settings: a community in Florida not well served by public transit, and a community in Chicago, Illinois that is served by extensive public transit. Phase I was conducted in September 2001 in the Florida setting, and Phase II was conducted in December 2001 in the Illinois setting.

Focus Groups Phases I and II

Phase I – Florida

Five focus groups were conducted in Florida on September 10th through 12th, 2001. All groups were coordinated via the Pasco/Pinellas Area Agency Program Coordinator, and all participants were recruited based on their past participation in local driver improvement programs (geared for seniors). All persons recruited were self-referred (in some cases participants are mandated by the court to attend via driving history/violations), and these focus groups were mixed gender groups. Further details regarding the participant composition can be found in Appendix B.

The local driver improvement program from which participants were gathered contains five driver services: education, assessment, retraining, mobility management, case management and agency referral. Because this driver program is the only program of its kind in the United States, it was therefore identified as a unique research opportunity (Zagroba 2001). By interviewing persons who had participated in this program, researchers could identify the potential success of the program and how it improved or accented

self-regulatory behaviors, as well as stipulate whether programs of the like should be continued and/or implemented in other locations.

Several objectives were identified for this focus group, and among those a few specifically relate to self-regulatory behaviors:

- How does driver education shape and change driving behavior?
- What are drivers' current driving patterns and how they have changed over the years (such as destinations and conditions) (Zagroba 2001)?

The focus group Discussion Guide may also be found in Appendix B.

Phase II – Illinois

The second set of focus groups was completed in the Chicago, Illinois region between December 11th and December 12th, 2001 at professional research facilities. Of the four groups, two groups were conducted at a location in downtown Chicago, and two groups were conducted in the suburb of Deerfield, Illinois (approximately 40 miles outside of Chicago). The groups were assembled based on gender (two groups were all-female and two were all-male). Details regarding participant composition can be found in Appendix C.

Several objectives were identified for this focus group, most of which relate to self-regulatory behaviors experienced by participants:

- How is self-regulation age-related among men and women still driving over the age of 70?
- What do older adults do to increase driving confidence/safety?
- When and what type of family conversations should take place surrounding driving transitions/changes associated with aging and self-regulation/driving cessation?
- How have people planned (i.e., transportation options) for the possibility of not driving in the future?

The focus group Discussion Guide may also be found in Appendix C.

Driving and the Self-Regulation Decision

The Phase I Focus Groups provided an opportunity for researchers to determine how drivers make the decision to self-regulate, and the type of practices used based on the fact that they had participated previously in a driver improvement program.

While the Phase I participants were recruited as such, the Phase II participants were not recruited based upon that factor. These drivers were all older than age 70, drive a minimum of 10 miles per week but a maximum of 20,000 miles per year, and drive at least half of the household driving. Through the two sets of focus groups, researchers were able to gain answers to pressing research questions as well as look for differences between people who had taken a driver improvement program and those that might not have participated in such an activity.

Ways in Which Drivers Self-Regulate

Phase I Results

One component of self-regulation involves the realization that driving skills have changed over time. The Pasco/Pinellas driver program provided an opportunity for the Phase I participants to more closely monitor their behavior in such areas as checking blind spots and maintaining speed with other cars. The focus groups findings indicate that the participants are more aware of their skills and the vehicle itself when driving.

Participants of the Phase I Focus Groups confirmed that they self-regulate in several ways, particularly by altering their driving patterns to avoid stressful situations, including many situations illustrated in Chapter 4. Pattern changes include avoiding heavy rain, nighttime driving, congestion/rush hour traffic, left-hand turns, long distance driving, adjusting speed (such as decreasing or increasing speed based on the flow of traffic), unfamiliar areas, solitary driving, driving while not feeling well, and minimizing distractions in the car (Zagroba 2001). These responses demonstrate that as people age, many are aware of changes in their driving abilities, and adjust their behavior accordingly.

Participants also indicated that most of them take fewer trips, and limit long-distance driving if at all possible. As was noted in Chapter 4, this type of behavior is experienced gradually over the years, which was also the case for these focus groups. They mentioned that they choose their driving times and situations more carefully as they age.

Participants of these focus groups had given little thought to driving cessation. Only about half had considered what they would do if they could no longer drive. Driving proves to be an integral—absolutely necessary—part of life. Many think that "*you might as well be dead*" without a car because you cannot go anywhere (Zagroba 2001). One participant shared, "*I live out in the country so we don't have any alternatives (to driving)...but I do think about it a little bit.*" The thought of driving cessation is scary to many older adults. They wonder how they will manage without driving.

Phase II Results

The participants of the Phase II Focus Groups indicated that they too use many self-regulation behaviors to feel safer while driving. The most common behaviors noted are: decreasing driving speed, avoiding heavy traffic, taking longer routes, planning in advance, avoiding left-turns, minimizing distractions in the car, concentrating more on driving, driving more defensively and less aggressively, increasing awareness and tolerance of others, driving with someone else who navigates, waiting for larger openings in traffic, increasing the effort to drive more safely, driving fewer miles overall, driving less at night, and driving less during rain or highway/freeway conditions. All of these are situations that are more challenging, which are noted as the types of behaviors that are avoided by many older drivers in Chapter 4.

Some of the self-regulation behaviors discussed by participants in the Phase II focus groups indicated less aggressive and more defensive driving as

they age. One participant noted "*you don't have to be too aggressive because adhering to a time schedule is not as important.*" They felt that as they aged they were in less of a hurry to do things and go places. Most participants of these focus groups were retired, which may contribute to the feeling of less scheduling necessities. Other contributing factors to the more defensive driving behaviors include increased awareness and tolerance of others on the road. They also noted that with the changes in feelings of safety and confidence they became more defensive. Different (less popular) routes and increasing the amount of time budgeted to arrive at the destination are part of increased efforts to drive more safely. One participant felt these changes were positive because they became aware of new, more attractive ways to go places.

Why Self-Regulate?

Phase I Results

When the discussion turned to reasons for driving cessation in the future, participants of the Phase I Focus Groups identified very general criteria such as innately knowing when to stop, family direction, medical direction, traffic violations /accident(s), and new or worsening health conditions. These were similar to the reasons discussed in Chapter 4, which included medical advice, nervousness driving, vision problems, medical conditions, family/friend advice, difficulty with motor skills, transportation provided by retirement center, cost to maintain a vehicle, involvement in a minor accident, and license revocation. One participant suggested the time to stop driving is "*when your wife tells you*" (Zagroba 2001). One participant indicated, "*I'll drive until I can't and I think I'll realize the day that I can't.*"

The main component to stop driving indicated in literature not provided by the focus groups participants was that of the cost to maintain a vehicle. The moderator mentioned this during the session, and only one respondent of all five groups had calculated the costs of owning and operating her vehicle each year. Participants indicated that owning a car includes an emotional component as well as the financial cost. The financial component is outweighed by the "cost" of not driving – the loss of freedom and independence. Although owning a car can be expensive, one participant called it a "*necessary evil.*" They would not spend their money on other modes of transport because they enjoy the convenience of owning their own car, and taxis are not reliable. Several commented that the sun is too intense to walk to the bus stop, and they would only consider transit if it would stop in front of their home. One participant indicated that if she had the opportunity to eat steak every day instead of driving, she would rather drive.

Phase II Results

The reasons behind the self-regulation behaviors of Phase II participants are varied; many people have experienced changing levels of confidence, fear, safety, and physical changes. One of the most significant motivators of changing driving behaviors is confidence. The focus groups indicated that many people feel less confident about their driving as they age, causing them to drive less frequently and shorter distances. The lack of self-confidence while driving leads

to an increased level of fear that may be attributed to physical (and cognitive) changes that make driving more difficult. Additionally, the participants of the Phase II focus groups noted that they are more aware of the aggressive behaviors of other drivers, another factor contributing to fear. Drivers who experience an accident while behind the wheel become increasingly more afraid to drive as well.

The most common physical changes discussed within these focus groups are: diminished eyesight (especially at night), hearing, physical reflexes, and neck/shoulder mobility (especially with regard to backing up). These changes are part of those recognized consciously and then (previously discussed) behaviors can be adapted to compensate for these changes. One participant shared, "*I lost the reflexes, the edge, that I had before.*"

With regard to driving cessation, the participants of the Phase II focus groups had not given much consideration to the idea, as was the case for the participants in the Phase I focus groups. One participant shared, "*If I feel I can still drive ... I'm going to drive because I don't want to give up my independence.*" As no questions directly asked how drivers would know when to stop, the majority of the cessation discussion related to who should be involved in the decision, to be described later.

Special Roles of Families and Physicians

Phase I Results

Participants in the Pasco/Pinellas County Focus Groups indicated that family and medical professionals would probably play a role in the decision to stop driving. Interestingly enough, during this discussion, law enforcement officials and the Department of Motor Vehicles were not mentioned. One participant shared, "s*omeone who continually drives with you and can point these things out.*" The Phase I participants noted that the person should be someone who has contact with the driver so that they might have a better idea of the driver's skills.

Only a few participants knew or had witnessed someone who had to actually stop driving. Without examples of people who had made the conscious decision to stop driving (or people who were forced to stop driving due to a medical condition or a court mandate), it was difficult for participants to think about and consider who or what would participate in the decision. Of the people who knew of someone who had stopped driving, none of their experiences were positive. One participant even said, "*I feel that people who don't drive have some sort of handicap.*" Such beliefs make it difficult to understand a time in which a family member or physician should discuss driving cessation.

Regardless of who brings up the conversation regarding cessation, one participant noted, "*If one person told me that I'd say no, no, no, I'd need a second opinion.*" She felt that ultimately the decision would need to be made with several opinions and that she would not blindly trust just one person.

Phase II Results

The Phase II Focus Groups discussed driving cessation, and the persons who should participate in a discussion when it is time to consider driving no longer. Key participants identified for this discussion were family members, and the particular family members who should initiate the discussion was also identified.

Older drivers from Phase II indicated that they prefer to be approached by a family member when a driving skill is questioned, instead of an outside professional such as a doctor or the police. As one participant shared (with regard to children instigating discussion), "*It's not the only way but it's a good way.*" Participants noted three components as being the most important when asked what was required for advice to be taken seriously from someone else surrounding driving issues/concerns. First, as mentioned, the person should be a member of the family. Second, the person should him/herself be a good driver, and third, the person should be someone who has frequent observance of the skills of the driver in question. Several suggested that they would prefer to also have a second opinion, because driving is so important for their mobility.

Most participants indicated that they prefer children to spouses for the driving discussion. Children are usually recognized as the most comfortable person for a discussion of driving concerns. If a child is not available for this discussion, the spouse is the next desired relative. Children are most likely cited as the best people to instigate the discussion because they are usually very close to the older driver, and someone with whom the driver would have frequent interactions.

A discussion of driving should be constructive, and should be brought about early. Participants noted that family members often wait too long to approach an older family member regarding driving concerns, at which point it is too late to improve driving skills. Older drivers are very concerned with an opportunity to improve their skills, but if that were not an option they would attempt to limit driving, but not cease altogether. As for particulars of the discussion, one participant noted, "*they should come to you with specific examples.*" Without having concrete examples, the older driver might disregard the comments of the family member.

Although many participants indicated that they would be upset or angry upon the first approach to discuss driving skills, they would appreciate family members who approach them again in the future to show concern. This approach would be considered most effective by many participants. It provides the opportunity for the older driver to adjust to the idea that their driving skills may be weakening, and that they may be approaching the day in which they should no longer drive.

While a family member is generally the one person with whom older adults would like to discuss driving skills, they prefer to be approached by an individual, not the entire family. Meeting with the entire family is seen as quite intimidating and even embarrassing for many older drivers. For someone to have been respected in the family for many years and then be questioned in front of everyone would be very difficult for many people, regardless of their age.

When asked about the role of the physician, participants indicated that they would listen to the advice, but evaluate everything. If for example, the doctor prescribed a medication that affects driving, the driver would consider cessation of driving. The doctor, however, was indicated as to not be the final authority on the driver's abilities, mostly because he or she does not observe the older driver in the driving situation. It was suggested that the physician would be an appropriate person to discuss driving with if the family had already mentioned a possible problem to the physician.

Ultimately, participants indicated that they want to be in charge of the final decision regarding driving cessation. They want to choose when and where they cease to drive, and how the decision comes about. Participants continually refer to their own judgment in knowing when to stop driving, although most of them have little or no experience with watching others stop driving. As one participant noted, "*You have to make your own final decision for yourself.*" Older drivers see driving as so crucial to their independence and survival that to allow someone else the power to decide when they stop driving would be crushing to their ego. One participant admitted that while it may not be possible to adequately know when to stop due to future mental states, "*I hope I can recognize when I can't drive.*" Older drivers want to know that they have the ability to make this final decision themselves. One participant shared his opinion, "*there may be a time when I'm around 95 or maybe 100 when I shouldn't drive.*" That was the age he identified as a time he would start to think about driving cessation.

Gender Differences in Self-Regulation

Phase I Results

Within Phase I, gender differences were not specifically noted. Gender was covered within Phase II.

Phase II Results

Through the discussion, it was noticed that men and women self-regulate differently because they differ in recognizing changes in driving ability. Women are more self-aware of age-related driving limitations (both physical and cognitive) and use more self-regulation techniques than men. Men typically view driving as a skill that changes due to the environment, while women see driving as a skill that changes with age (Zagroba 2002).

Gender appears to factor into the decision about the best family member with which to discuss driving concerns as well. Some women feel that a child has the older adult's best interest in mind and who has observed the driving behavior would be the best candidate. If not the child, then the women preferred their spouses to be the instigator of the discussion. Some men indicated that they specifically did not want their spouse to discuss driving with them.

Male responses in the Phase II Focus Groups indicated that they would look to their wives (of those who were married) to be the primary driver when they stop driving. While women viewed their husband as high on the list of several transportation options upon the decision to stop driving, men were much more likely to see their wives as the next person to be the driver. To this end,

however, the male participants gave very little thought (even during the discussion) to driving cessation. As one male shared, "*I'm living in a hip-hop generation and you're talking to me about not driving*?"

With regard to educational experiences, women are more likely to be interested in a defensive driving course than men. While such a course may be appropriate in the future, a majority of the men in the Phase II focus groups indicated that they saw no current pressing need to take a course. Women identified a desire for reinforcement of their skills, but the men indicated that their driving ability was find and that it may be improved only with practice and more on-the-road driving. One male participant shared, "*A defensive driving class would not be helpful – if you haven't learned it by now you won't.*" This knowledge could be useful to researchers when developing marketing strategies for defensive driving courses.

Promoting Self-Regulation

As discussed in Chapter 4, educational programs might assist older drivers to know when and how to self-regulate. The Phase I Focus Groups were structured so as to determine what behaviors changed (self-regulatory) as a result of taking the Coaching the Mature Driver Course (CMDC). The CMDC is described in Appendix B and is administered locally to the Pasco/Pinellas County area.

The Phase II Focus Groups included questions designed to determine what type of course or assessment would be helpful and most credible, particularly looking for responses from people who had not participated in such courses previously.

Role of Education in Attitude Change

Phase I Results

As a result of the educational class, participants of Phase I indicated that they changed many behaviors. Drivers said they now understand their blind spots, including those of other drivers, and modify driving so as to avoid driving in other people's blind spots. Participants also indicated that they are more aware of their physical relationship to the car, such as the steering wheel and seat adjustment. As a result of this understanding, they may regulate themselves to use proper alignment to have full control of the vehicle. While this concept is not specifically addressed in literature, it has profound impacts on a driver. Once a driver is properly positioned within the vehicle, he or she may have more control and thus the ability to potentially avoid a crash more successfully.

Participants also indicated that they use mirrors more frequently, maintain speed with other cars (to avoid driving too slowly or too fast), and maintain a safe distance between them and the car in front of them. One participant even said, "*I thought I knew how to drive…but there were a lot of things I learned, little safety things I didn't even THINK about.*" According to the testimony of participants, their behaviors did change as a result of the class, although no before-after data is available to prove that this was true. Another participant said, "*I use my signals more than I did before.*"

These driving habits that have changed as a result of the CMDC (according to participants) indicate that attitudes and perceptions may be changed. These drivers participated in an educational class that allowed them to learn about behaviors and ways in which they may become more safe drivers, and they indicated a desire to use the knowledge they learned.

Through the Phase I focus groups, participants also indicated that they discussed the changes that are associated with aging, such as decreased reaction time and vision difficulty at night during the CMDC. These discussions allowed the drivers to understand some of the times in which it is potentially unsafe to drive, and ways to change their habits. Perhaps the benefits would be even more realized if participants were able to frame the self-regulation decision as a safety issue from the start, and always be conscious of safety.

Phase II Results

As indicated in the section regarding gender for Phase II, the male groups believed that an educational course would not be useful or helpful in changing habits. The women did believe that a course or assessment would benefit them in terms of driving skills and ability, but the specific relationship between a class and how to promote attitude change was not discussed in the Phase II Focus Groups.

Benefits of Self-Regulation

Phase I Results

Upon completing the CMDC, participants of the Phase I Focus Groups indicated that they now understand how beneficial self-regulation can be. Benefits could be safety measures – avoiding driving during rush hour when so many people are on the road, or health-related such as the psychological benefits of avoiding stressful situations. The benefits of changing their behavior with respect to the vehicle are seen as positive as well; participants understand the safety aspects to their physical position in the vehicle (and scanning mirrors, etc.) and are eager to use them to improve their driving skills. When the alternative to improving driving is to stop driving altogether (after a crash, etc.), drivers will do almost anything to keep their licenses.

Phase II Results

Specific benefits of self-regulating were not discussed in the Phase II Focus Groups, but participants were asked what they do to promote driving confidence and safety. Basically, the goal behind the question was to determine what self-regulatory behaviors the drivers use for the benefit of greater on-road confidence and safety measures.

Participants indicated that they have become less aggressive and more defensive with age. One shared, "*you don't have to be too aggressive because adhering to a time schedule is not as important.*" This attitude allows older drivers to feel less pressure about driving too fast to arrive on time. Additionally, drivers admit to increased awareness and tolerance of other aggressive drivers.

In order to promote safer driving, participants indicated that they take different routes (potentially less-traveled routes) and increase the amount of time needed to arrive at a destination. They plan their trip with extra time on either end to allow for safer driving along the way. Through regulating their behavior in the ways mentioned, older drivers benefit from less perceived stress on the roads and safer driving, which hopefully reduces accidents.

Through this chapter, key thoughts and opinions about self-regulation and self-regulatory behavior were outlined through focus groups. These should be remembered whenever policymakers think about making decisions regarding the regulation of older drivers. Through previous research, it has found that the decision to stop driving is a very difficult one (Persson 1993). As one Phase I respondent noted and research should remember, "*the idea of losing your ability to drive is terribly traumatic…you don't have a lot of independence left.*"

6

6: Future Research

Upon learning about older drivers and their self-regulatory practices, one may then discuss the public policy consequences that may result. Is the behavior exhibited by the Focus Groups participants the appropriate way to address regulating older drivers? Additionally, is such behavior sustainable based on the predictions about older adults and their driving patterns in the future?

If the number of people dying each year is acceptable by societal standards, then perhaps the level of public policy that currently exists around older drivers is appropriate and does not need to be altered. However, if regulators and their constituents believe that these numbers are still too high then discussions should be shaped around the ways in which it would be appropriate to remove unsafe older drivers from the roadways while allowing those drivers who are perfectly safe to remain behind the wheel. Because most of the accidents that occur do so on such a small scale that there has never been much attention on one particular accident or crash.

With regard to re-licensing, one Focus Group participant shared, "*I see nothing wrong with states not licensing people after a certain point but I don't think there should be an AGE...everybody is different at a certain age.*" There is consensus among most people that there are some unsafe older drivers on the roads, but as this participant noted, one cannot judge the capabilities or future performance of a driver based on chronological age alone. The states should consider other options for promoting traffic safety.

As policy is concerned, the current state-of-the-practice is so limited that the only traffic safety measure that currently exists in most states is either reporting by someone else or an accident in which the older driver is at fault. Why is this discussion focused on the Departments of Motor Vehicles? Because "state licensing agencies are the only institutional mechanism to identify older impaired drivers other than their being cited by law enforcement or an accident" (Cobb and Coughlin 1997). With so many different regulations among the states, the current policy is fragmented, and not very effective on a nationwide basis. Re-licensing of older drivers should be reconsidered with ways in which older drivers could possibly improve driving *before* it becomes a problem.

Self-Evaluation

Knowing now that older drivers use self-regulation and in what manner in daily driving patterns, regulators may begin to think about ways to encourage

more of this type of behavior. Through self-evaluation a driver may understand his or her weaknesses in driving and be able to compensate for that through advances in technology or a reduction in driving. Educational programs may be developed and even encouraged by state legislators as a tool to promote traffic safety. By providing non-official educational centers, older drivers would not feel as threatened by the idea that the Department of Motor Vehicles is watching how they react and possibly threatening to take away the drivers license from someone who performs poorly.

Technology Training

While ideally the state licensing agencies (most commonly the Department of Motor Vehicles) would provide some type of test for people to determine if they are safe drivers, realistically they have no budget for such implementation. The technology may be available in terms of simulators and such, but the cost prohibitive. Even for the licensing agency to hire someone to do road tests is beyond financial means.

One Focus Group participant shared, "t*ests given by state DMVs should be giving you an option to improve – they should tell you what you did not pass.*" The option to improve one's driving skills before losing the license completely was shared by most people within our study. If technology within the Departments of Motor Vehicles could be such that a driver could be tested and then given suggestions on how to improve traffic safety might improve within that community. For this to be successful, however, many older drivers would need to participate in such activities, and building consensus around such testing could prove difficult.

It is common for public administrators and policymakers to "largely limit their analyses to incremental or marginal differences in policies that are chosen to differ only incrementally" (Lindblom 1989). Policy does not, and most likely will not ever, move at warp speed. By choosing only minor modifications there is likely to be less opposition from stakeholders, and thus simplifying the task at hand. Through such simplifications policymakers also tend to ignore the consequences of potential policies, as well as the positive aspects of neglected consequences (Lindblom 1989). It has been, however, the best way in which policymakers affect change.

Fitness

Physical fitness relates to a person's ability to function well in a given environment, and this may be extended to discuss fitness relating to driving. Someone who exercises more frequently will typically have greater flexibility than someone who does not, which may help a driver's neck rotation for checking blind spots. The ability to grip a steering wheel also becomes easier with stronger arms.

Perhaps policymakers could structure drivers' educational models for older adults with a fitness component, making driving seen as a physical skill as well as a cognitive one.

Concern for Lifelong Mobility

Senior transportation is a key issue for the future. Driving is consider crucial to the lifestyles of many older adults. As one Focus Group participant shared, "*if they found something wrong with my driving, and I could improve the skill, I would do whatever it took to improve the skill. If my driving were that bad that I could not do it I would just reduce the amount of driving I did, only drive if it were a necessity.*" Public transit has not been a suitable substitute for driving in the eyes of many people.

Given the data found during the Focus Groups, there is room for incremental change regarding re-licensing of older drivers. People are welcome to suggestions on how to improve their driving ability if the consequence is license revocation, and this should be considered by administrators of the Departments of Motor Vehicles. While research has found that older drivers may contribute a higher share of traffic safety problems, more stringent licensing requirements are likely to limit the mobility of older adults. To this end, when evaluating the renewal requirements, policymakers must weigh the costs of reduced mobility for seniors against the traffic safety benefits that may arise (Levy 1995).

Additionally, with modifications to existing public transportation available to older adults, this could become a more viable option. With a cooperation of public and private services, a combination of skill enhancement and testing could be found that could adequately prepare older adults for the continuing challenges of driving as one ages.

Future Research

Previous research has found that "the promotion of self-regulation as a method for improving safety among older drivers with visual/cognitive impairments is intriguing and deserves further examination" (Ball, Owsley et al. 1998). For those drivers with the most severe functional impairments, self-regulation may not sufficiently reduce crash risk, and driving cessation may be the only safe option. One advantage of self-regulation as a mechanism for reducing crash risk is that it may be cheaper than governmental intervention programs, and perhaps could be based on existing health care delivery systems involving eye care. An intervention evaluation study on this topic could go far in examining the feasibility of this approach" (Ball, Owsley et al. 1998).

One study suggested, "we should learn more from drivers about their motivations to stop and the process of self-regulation, to provide a more-reasoned approach to reducing crash rates among older drivers" (Dellinger, Sehgal et al. 2001). With the given constraints upon Departments of Motor Vehicles as they are currently structured, perhaps an enhancement of the existing informal self-regulatory model could be enacted. Ways in which this could take place should be studied with preferences of older persons.

As the federal government cannot regulate drivers, maybe a discussion should take place around the idea of a national drivers license. Particularly in today's society in which national safety and security is an issue, a federal-issued piece of identification could be useful.

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Appendix A – State Driving Regulations

Information for this compilation was obtained from several sources. The AAA Digest of Motor Laws was the first source of information, followed by contacting the motor vehicle agency within each state, i.e., the agency charged with the issuance of driver's licenses. Every effort was made to ensure the validity of the information contained within, but in certain cases some information was not available. In selected states where documented regulations were incomplete or unclear, telephone interviews were conducted to better understand what the rules are in each state as well as how they are implemented. The Internet was also used to locate some information, but comprehensive information was not available on all websites. (Coley and Coughlin 2002)

Table 1

State Driving Regulations

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Alabama	none	4	in person (or by mail if out of state)	written, road sign, driving, and vision required for original	only for original	20/40 or 20/60 with corrective lenses, 110 degrees peripheral	none
Alaska	none	5	in person	written, visual, and driving for original	with regular renewal	20/40, no peripheral	none
Arizona	length of license at age 65	from issuance until 65th birthday; then 5	in person	can be done by 3rd party; written (or road may be) required at the examiners discretion	every 12 years (and new photo)	20/40, 70 degrees peripheral	only if you act not mentally competent - up to discretion of examiner
Arkansas	none	4	in person	written or oral, driving and vision for original	with regular renewal and out-of-state transfers	20/40 or 20/50 with corrective lenses, 140 degrees peripheral for person with 2 functional eyes and 105 degrees for person with one functional eye	none

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
California*	at age 70 not eligible for renewal by mail	usually 5	in person or by mail if good record or if out-of-state	written, road sign, eye, and driving for original	if not renewing over mail (if by mail several times vision test required)	20/200 or better in best corrected eye, unknown peripheral	none
Colorado	none	5 if over 25	in person with eye test; sometimes renewal allowed by mail (randomly chosen by computer)	written, road sign, eye, and driving for original	with regular renewal	20/40, no peripheral	must sign form for each renewal stating that driver has no medical condition with episodes of lost consciousness
Connecticut	vision tests required after age 65, and 2 yr license renewal for persons over age 65 upon request to DMV	4	in person unless 20+ miles from branch office or out-of-state; will use photo on record (certain ages only)	written and oral, vision, and driving for original	for original; required for drivers older than 65	20/40 in each eye with/without corrective lenses, 20/30 if blind in one eye, 90 degrees peripheral in each eye	none unless examiner determines further testing necessary
Delaware	none	5	in person	written, vision, and driving for original; written and road upon renewal at discretion of division	every 5 years	20/40, no peripheral	none

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Dist of Colombia*	70+ must submit doctor's report upon renewal; mandatory re-exam for all drivers over age of 75	5	in person (one-time renewal by mail if 200 or more miles away)	written or road may be req'd based on medical condition (special test may be req'd for applicants over age 70)	with regular renewal	20/40 in one eye with no less than 20/70 in other, unknown peripheral	none
Florida	only if it is determined that you must be retested by officer or doctor	4 or 6 (if safe driver)	in person or by mail, phone, or internet (for 2 consecutive renewal periods only)	ability to read and understand hwy signs regulating, warning, and directing traffic; driving for original; hearing and vision tests for renewal)	with regular renewal	20/40 each eye and both eyes with/without correction or referred to a doctor (could be as low as 20/70), no peripheral	none but driver questioned about seizures or lost consciousness
Georgia	on individual basis (if DMV receives notification of problem)	4	in person; one renewal by mail if military or student	driving, written, and vision for original	with regular renewal	20/60, 140 degrees total or 70 degrees in each eye peripheral	only if notice is received from law or doctor, etc. (on individual basis)
Hawaii	length of license at age 71	2 for 71+ (6 for 18-71, 4 for 15-18)	in person unless by mail (out-of-state only and only allowed twice)	written, vision, and driving for original; vision test for renewals	with regular renewal	20/40, 140 degrees total or 70 degrees in each eye peripheral	none unless imposed by other people (e.g. medical board)

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Idaho	only if referred by family member or physician	4, 8 optional	in person; 4 year license may renew once for 4 more years by mail, next one must be in person; 8yr licenses cannot renew by mail	written and vision for original; vision required and road test at discretion of examiner for renewals	with regular renewal	20/40 in one eye, no peripheral	none
Illinois	mandatory road test at age 75	4-5 until 81, 2 for 81-87, 1 for 87+	in person; by mail only if temporarily out-of-state	written with renewal (at least every 8 yrs), driving test if 75+ (may be waived up to age 75)	usually on renewal	20/40, 140 degrees peripheral	it is required that drivers who have a medical condition which is likely to cause loss of consciousness must be reported
Indiana	length of license at age 75	4 until 75, 75+3	in person; by mail if overseas or military	written, driving, road sign, and vision for original though road may be waived through department of Driver Education	with regular renewal	20/40, no peripheral	none
Iowa	length of license at age 70	4 from birthday until 70, 2 for 70+	in person only (as of June 1, 2000)	optional on part of examiner - if mental or physical problem thought to be possible	with regular renewal	20/40, 140 degrees peripheral	optional on part of examiner
Kansas	length of license at age	probationary 14-16, 4 for 16-21 and 65+,	in person unless military or out-of-	written (open book) and vision tests for	with regular renewal	20/40, no peripheral	none

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
	65	6 for 21-65	country	renewal			
Kentucky	none	4	in person unless full-time military or temporarily out-of-state	written, driving and road sign, vision, hearing, and physical disability tests for original	not on renewal unless license is expired	20/40 for no restrictions or 20/60 restricted to glasses and failed 20/60 reviewed by medical board, 110 degrees peripheral	none
Louisiana	length of license at age 70	4 until 69, 2 for 70+	in person; by mail in certain circumstances (out-of-state and not 70+)	persons 60+ applying for first license must submit doctor's report about vision and physical condition	with regular renewal	20/40, peripheral unavailable	none
Maine	length of license at age 65	6 until 65, then 4	in person	oral or written, road sign, driving, and vision for original	"regular driver's license renewal includes a vision test" but also at first renewal after ages 40 and every renewal after age 62 (40-45, 52-57, 62 and older may renew by mail and be tested by their physician)	20/40 without restrictions or 20/60 with, 140 degrees peripheral without restrictions and 110 with	none, but if they have medical problems doctor(s) required to fill out form

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Maryland	if 70+ and applying for new license, must present proof of previous satisfactory operation of a motor vehicle, a written certification from a licensed physician attesting to general physical and mental qualification	5	in person unless outside of state temporarily	vision for renewal	with regular renewal	20/40, 140 degrees peripheral	none - question on application to ask if driver is ok to drive
Massachusetts	none	5	in person	only for original	with regular renewal	20/40, 120 degrees peripheral	none
Michigan	none	4	in person; one additional four-yr period allowed by mail	road for all new drivers and if license expired over 4 yrs; written and visual for renewal	with regular renewal	20/40, 140 degrees peripheral with two eyes or 120 degrees with one good eye	none - required to ask if in past 6 months haven't had blackouts or other physical or mental problems to drive safely

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Minnesota	none	4 if over 21	in person - vision and new photo req'd unless out-of-state	vision for renewal	with regular renewal	20/40, 100 degrees peripheral (added together	none
Mississippi	only if renewal attendant detects some reason that one is unfit to drive	1 for 16-18, 4 for 18+	in person; Military stationed out-of-state allowed to renew by mail	only for original	only for original	20/40, no peripheral	only if renewal attendant detects some reason that one is unfit to drive
Missouri	length of license at age 70	born in even year get 6 yr license (21-69) odd year then 3 year; over 70 gets 3 year license; 16-18 is 2 yrs, 18-21 license for 3 years	in person unless out-of-state military	vision and sign recognition for renewal	with regular renewal	20/40 in either or both without restrictions, up to 20/160 with varying degrees of restrictions, 55 degrees peripheral in both left and right eyes or 85 degrees in either eye with restrictions	none, but questions on verification sheet regarding seizures, etc.
Montana	length of license at age 75, and 75+ may be tested again upon examiners judgment	everyone gets 8 yr license unless younger than 21, 21-75 get 8 yr license, 75+ get 4 year license	in person or mail in (only once)	vision for renewal	with regular renewal	20/40, no peripheral	none - application asks questions about this type of information

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Nebraska	none	5	in person; by mail for only two more years (25% chosen randomly)	vision required and other decided at discretion of examiner	with regular renewal	20/40 without restrictions, 140 degrees peripheral	asked questions regarding medical history - medical statement might be required
Nevada	vision test and good physical condition at age 65 or may have doctor sign form instead	4	by mail once every 8 years or in person	vision, written (if 3 or more tickets in 4 yrs), and driving (if 6 or more tickets in last 4 yrs) for renewal	with regular renewal	20/40, no peripheral	none
New Hampshire	driving test at age 75	4	in person	vision for renewal and mandatory license re-examination driving test for anyone older than 75	with regular renewal	20/40, no peripheral	none
New Jersey	none	4	in person, mail, phone, or internet	written and vision for original and new residents	only for original	20/50, no peripheral	none
New Mexico	length of license at age 75	4 or 8 until 74, 1 for 75+	in person	road , written, and vision if license expired more than 1 year	with regular renewal	20/40 in one eye or 20/70 with both eyes, no peripheral	none
New York	none	8	in person or mail with form filled out	written, vision, and road-sign, and 5-hr classroom course	with regular renewal	20/40 but no less than 20/70, 140 degrees	none

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
			by doctor	for original		peripheral	
North Carolina	none	between 4 and 8, trying to get back on 5 year plan (age determines length of license)	in person; by mail if out of state at time of expiration	no written for renewal unless person has been convicted of a traffic violation since license was last issued, or he/she suffers from a mental or physical condition that impairs his ability to drive; sign and vision test for renewal, testing required for anyone with a license expired more than 1 year (how much testing at discretion of examiner)	with regular renewal	20/40, no peripheral	at discretion of examiner to medical unit if test warranted
North Dakota	none	4 unless new then could be 3 or 4	in person	vision for renewal	with regular renewal	20/40, 105 degrees peripheral	at direction of examiner
Ohio*		4	in person req'd (vision screening)	vision required, written and driving tests if license expired 6+ months for renewal	with regular renewal	20/40, unknown peripheral	none

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Oklahoma	none	4	in person or by mail without photograph (no digital imaging)	written, vision, and driving for original	only for original or if license expired more than 3 years	20/40, no peripheral	none
Oregon	vision test required at age 50	4 until 10/00, 8 if after 10/01/00 - going to 8 year issuances	in person required if over 50, if younger than 50 and not turning so within 4 years may renew by mail	knowledge, sign, driving, and vision for original	every 8 years if older than age 50	20/40, 110 degrees peripheral	at discretion of examiner or if out-of-state medical requirements on record
Pennsylvania	length of license at age 65 optional	4 until 64, at age 65 license may be 2 (optional)	in person or by internet	only for original	only for original or random retest - not on renewal	20/40 uncorrected or 20/70 daylight driving only, 120 degrees peripheral	none
Rhode Island	none	5	in person	vision for renewal	with regular renewal	40/40 or 40/20, unknown peripheral	none
South Carolina*	none	5	in person	vision required, knowledge test for renewal if more than 5 points in 2-yr period for renewal	with regular renewal	20/40 but up to 20/70 in one eye if other eye at 20/200, unknown peripheral	none
South Dakota	none	5	in person, by mail if out-of-town	vision for renewal	with regular renewal	20/50 but 20/60 can be restricted	none

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
						and 20/70 denied, no peripheral	
Tennessee	none	3-7 based on age or date of birth; 22 is 3 yr, 23 is 7, trying to get everyone on 5 yr renewal	in person, by mail (if renewed in person year before), or internet	only for original	only for original	20/40, no peripheral	none
Texas	none	2 for 16-18, 4 or 5 or 6 for 18+ until 1/01/02 then all 6 for 18+	in person, by mail if eligible (picture is on file), or on website	vision for renewal if in person	with regular renewal	20/50 with corrective lenses or 20/40 without, no peripheral	none
Utah	none	5	in person; every other cycle done by mail (if driver has no suspensions)	written and vision for renewal	with regular renewal, but if older than age 65 eye test may be given at personal physician's office and sent in with renewal	20/40, 120 degrees peripheral	at any time medical information reported by questionnaire then driver must have a medical profile, or doctors or police officers can write in with concerns
Vermont	none	2 for 16 and 17, 4 for 18+	in person or by mail	only for original	only for original	20/40, peripheral requires that eyes must be able to look left and right at nose	at discretion of examiner or if note sent in from doctor or police officer

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Virginia	none	5, expiring at age evenly divisible by 5	in person, mail, phone, fax, or internet - but every 10 years must take vision test	only for original	for renewal, but waived for mail, phone, fax, or internet renewal	20/40 in one or both or 20/70 if restricted to daylight, 100 degrees peripheral in one or both eyes or 70 degrees if restricted to daylight	only if notified by doctor which is not required by the Commonwealth
Washington*	none	4 until 7/1/00, then 5	in person	vision for renewal; re-examination may be req'd based on physical or mental condition	with regular renewal	20/40, unknown peripheral	mental condition may merit re-examination
West Virginia	none	until age 21, 5 for 21+; changing over it's 3-7 now to years divisible by 5	in person only	only for original	only for original and out-of-state transfer	20/40, no peripheral	none
Wisconsin	none	initial license 2 yrs, 8 for regular - renewals	in person only	only for original; sign and vision for person who holds valid out-of-state license	with regular renewal	20/40, 20 degrees from center in at least one eye peripheral	only if recommended for special road test (by doctor or vision test specialist or police officer)

	age-related restrictions	length of license (years)	renewal conditions (in person, mail-in, internet)	physical testing	vision testing	visual requirements	mental testing
Wyoming	none	4	by mail if no suspensions within previous four-yr period and if last renewal was in person; else in person	for original, though road may be waived on completion of driver education course; vision and skills test once in 8-yr period at discretion of examiner for renewal	with regular renewal; also with mail-in	20/40, 120 degrees peripheral	at discretion of examiner

*** Indicates incomplete information**

Source: (Coley 2001)

Appendix B – Phase I Focus Groups

Taken from (Zagroba 2001)

Research Design/Methods

Five focus groups were conducted in Florida on September 10th through 12th. All groups were coordinated via the Pasco/Pinellas Area Agency Program Coordinator. All participants were recruited based on their past participation in the CMDC (4 groups) and/or the Getting in Gear Assessment (GIGA) (1 group). All persons recruited for the GIGA successfully passed the assessment and were self-referred (in some cases participants are mandated by the court to attend via driving history/violations). Details regarding the participant composition can be found in Appendix A (page 13).

The Area Agency on Aging of Pasco Pinellas received a grant from the Department of Transportation to develop and implement a senior driver intervention program. This unique program contains five "driver" services: education, assessment, retraining, mobility management, case management and agency referral. This program is the only program like it in the United States and, therefore, it provided a unique research opportunity for Hartford/MIT.

The CMDC is a six-hour program designed to promote defensive driving. Completing the course allows participants a three-year discount on their automobile insurance. The course costs $10 and is available to everyone aged 55 or older.

The assessment is a combination of tests designed to examine general physical, mental, visual, and driving abilities. It takes approximately 2 hours and consists of: 1) Grimps—battery of tests to determine level of efficiency one can safely drive in traffic environment; 2) Useful Field of View—a touch screen computer test that detects visual decline; 3) Brake Reaction Time Test—scores actual time it takes to go from gas pedal to brake; and 4) Automated Psychophysical Test—a) a fully automated computer test with joystick and b) Road Test through major intersections and back roads. The assessment test is free-of-charge.

The groups gathered reactions to the following topics:

1) Coaching the Mature Driver Course
2) Getting in Gear Assessment
3) Current Driving Patterns
4) Driving in the Future

Participant Profile

All participants were recruited based on their past participation in the CMDC (4 groups) and the GIGA Test (1 group).

GROUP	# OF PARTICIPANTS
GROUP 1: September 10 Took CMDC within past 24 months ➢ Females 5 ➢ Males 4 ➢ Age Range 60-86	9
GROUP 2: September 11 Took CMDC within past 3 months ➢ Females 5 ➢ Males 4 ➢ Age Range 58-89	9
GROUP 3: September 11 Took CMDC within past 3 months ➢ Females 4 ➢ Males 4 ➢ Age Range 63-84	8
GROUP 4: September 12 Took both CMDC and Assessment ➢ Females 6 ➢ Males 2 ➢ Age Range 69-88	8
GROUP 5: September 12 Took CMDC within past 3 months ➢ Females 4 ➢ Males 2 ➢ Age Range 66-85	6
TOTAL PARTICIPANTS =	**40**

Discussion Guide

The Hartford Affinity Personal Lines Research Department
Massachusetts Institute of Technology

MIT / OLDER DRIVER RESEARCH **Date of this version: 8/24/01**

10 minutes

I. Introduction: Good Afternoon/Evening. Welcome and thanks for participating in....

a. Moderator introduction—My name is _____ and I am here doing research at the request of the Massachusetts Institute of Technology or as some of you may know it, MIT. My role here as a researcher is to get us through a list of specific questions, stay on track, and get us unstuck if we get stuck.

b. How many of you have participated in a **Focus Group** before? A focus group is a research tool used to hear, first hand, what you have to say*!* Instead of me interviewing each of you individually, I want you to think of it as a group interview. Research shows that group interviews are excellent at generating ideas.

c. **"Ground rules":**

1. Balanced participation, hear from all of you
2. Not seeking consensus, no wrong answers, all input (open & honest) is valuable
3. This session is being videotaped / remain confidential--you don't have to worry about turning up in any commercials, one person at a time (audible for tape)
4. An associate / my associate is/are here, because they want to hear first hand your feedback and to ask additional questions if necessary.
5. Pick up monetary gift for being here on the way out
6. Informal / Enjoyable 2 hours discussion.....

d. **Participant Introductions:** Before we begin to talk about why you were invited to participate in today's/tonight's group, I want to learn a bit more about you...In about 30 seconds, Name, age, household composition, hobby/free time activity.

e. **Why You Were Chosen?** All of you were recruited to participate in today's/tonight's focus group because you recently (within the past X months) completed the "Coaching the Mature Driver" Class (Have them all agree). We have gathered you here to talk about this class and about driving issues in general. This will become clearer as we go along.

20 minutes

II: "Coaching The Mature Driver" Class

a. How did you learn about the "Coaching the Mature Driver Class?"
b. On the sheet of paper in front of you, I would like you to write down all the reasons why you took the class.
c. Looking at your sheet of paper, what are some of your reasons why you took the class (Keep in mind: all self-referred)?
d. What did you like about the class? (Find useful?)
e. What did you learn that was new?
f. Did the class change any of your driving habits or driving behaviors as a result of what you learned?
g. Were all the reasons why you took the class fulfilled or met? Anything not met?
h. What did you not like about the class? What would you change about the class?

25 minutes

III: Testing

a. During the "Coaching the Mature Driver" class, sheets of information were passed out to you regarding the "Getting in Gear" program that offers the opportunity to take a driving assessment test. Do you recall this?

   Refresh memory: Driving Assessment tests your present driving functioning with computer portion, paper and pencil portion, and road test.

b. Have any of you taken this assessment? Flip over the sheet of paper and list out all the reasons why you did not take the test? Go over answers (probe: fear, test failure, emotion, scientific validity, credible) and put on flip chart. After, have them prioritize top 3-5.
c. Do you believe a test such as this is useful? Why?
d. Do you think a test like this is credible or trustworthy? If not, what would make it more credible? (Probe: Technology. Paper/Pencil. Computer. With a road test).
   -Does it matter what tool is used? (Probe: What is the most credible tool?)
   -Does it matter who administers/gives it? (Probe: Most credible person--Medical Doctor, Scientist, Nurse, Trained Professional, Therapist, DMV, Policeman?)
   -Does it matter where the test takes place? (Probe: Most credible place--AAA, DMV, Hospital/Clinic, Univ., Health Club Wellness Center, Wellness Driving Center—part of / stand-alone)

-If we were in the business to create a "winner" Driving Testing Program/Facility. From your answers above, could we assume it would be...go over most credible above...revisions?
(Probe: classes, money, confidential, stand-alone center)

e. What would motivate you to take the assessment? (probe: insurance discount, confidential, declining health, vision, scientific validity, credibility)
f. Can you envision a time in the future when something will change your mind, when you would want to take the assessment and what would that be?
g. If you think such a test is useful, how can we "market" it differently to appeal and get the attention of more people?
h. Would you pay for such an assessment? How much? Range $5-$10.
i. If you took the test, and the results were not favorable, what would you do? How would you change your driving behavior?

5 minutes

Stretch Time: *I am going to check with my team to see if there are any additional questions at this point. Please stretch and feel free to get another beverage...*

45 minutes

IV: Driving Now: Now I would like to switch gears and talk about driving.

a. Going around the table, how many years have you been driving? Has anyone ever driven as part of your profession / job? If so what?
b. Do you consider yourself to be a primary driver of your household or a secondary? If you think about those who live in your household, when you travel together, who is usually the person who drives? (probe: spoken or unspoken rules)
c. Does anyone depend on the other driver for his or her transportation needs?
d. [Meaning]: What does driving mean to you? (i.e., freedom, everything) How much do you pay for freedom?
e. This sheet of paper I am passing out lists destinations that people drive to and under what conditions they might drive. At the top fill in how many days you drive per week and total miles. Go over how many days driven per week, total miles (how easy or difficult this is to do).

   Now, what I would like you to do is go through the list of destinations and conditions (down the left hand side of the page--ignore rest of page for now) and add any that are not there. What did you add? Next, pick top 3—Most important and keep you off road.

   Lastly, go through the worksheet and indicate what you still do, what you don't do, and what you still do in some way but with alterations. (i.e., hairdresser example—from going self, to having a friend take, to doing it at home yourself).

f. We all want to feel safe and comfortable when driving, what are some things that make you feel uncomfortable/unsafe when you drive? (i.e., health, physical limitations, negative experiences caused by others, car, environmental conditions, etc.)
g. What specific steps ["self-regulation"] have you taken to address the things you feel unsafe or uncomfortable with? (changes to behavior, vehicle, alternative transportation, others)

[Patterns]: How have your driving patterns changed over the years (i.e., frequency, length, function) and why? (i.e., need, health, aggressive drivers)

h. Did they experience any special events in the last few years (surgery, accidents) did these events change their driving patterns?
i. To what extent has your driving become limited to specific routes and/or times?
j. Have any of you ever sat down and calculated how much it costs you to own, operate, and maintain a car over the course of a year? What do you think it costs per mile to run vehicle. (Insurance, Maintenance, Car Wash, Gasoline, etc. -- DOT =.41)
k. Transportation options (transit, bicycle, walking, van service, other family members or friends) Are they available, Have/Do they use them, If won't use them why?

10 minutes

V: Driving In Future: Now, lastly I would like to talk about driving in your future.

a. Have any of you given any thought to the possibility of not driving in the future?
b. How do you envision this to happen?
c. Do you have any set criteria or conditions in which you would stop driving?
d. Who will play a role in your driving decision? (Probe: spouse, family members, friends, and physician, DMV.)
e. What is their experience with seeing other people stop driving?
f. What is their preference for outreach materials?

5 minutes

One Last Check With Team For Questions…….

VI. Close: Thank & terminate.

Driving Worksheet

How many days do you drive per week? _____

Total miles: _____

	Drive	Don't Drive	Alternatives
Destinations:			
Food/Drug Store			
Other Shopping			
Worship			
Medical Appointments			
Work			
Family/Friends			
Entertainment			
Volunteer Activities			
Social/Recreational			
Conditions:			
Driving Alone			
Long Distance			
Night Driving			
Rush Hour/Congestion			
Freeway/Interstate			
Bad Weather			
Unfamiliar Areas			
Not Feeling Well			
Other _____			
Other _____			
Other _____			
Other _____			

Zagroba, L. (2001). Executive Summary and Report of Older Driver Self-Regulation Research. Hartford, The Hartford Insurance Company.

Zagroba, L. (2002). Phase II Focus Group Findings: Older Driver Self-Regulation Research. Hartford, CT, The Hartford Insurance Company.

Appendix C – Phase II Focus Groups

Taken from (Zagroba 2002)

Research Design/Methods
Four focus groups were conducted in Illinois on December 11th and 12th at professional research facilities. Two groups were conducted at a downtown Chicago facility and two at a suburban Deerfield facility (approximately 40 miles outside of Chicago).

The facilities recruited all participants based on the following screening specifications:

1) Gender (2 + years)
2) Drive at least ½ of household driving
3) Average number of miles driven per week (minimum 10 in city and 20 in suburbs)
4) Average number of miles per year must be less than 20,000
5) Less likely to drive in at least 3 of the following conditions: night, long distance, rush hour/congestion, freeway/interstate, bad weather, unfamiliar areas all female groups and 2 all male groups)
6) Age: 70

Details regarding the participant composition can be found in Appendix A (page 16).

The groups gathered reactions to the following five topics:

5) Self-regulation (why, when, where, and how)
6) Test Credibility and "model" driver education program
7) Family conversations
8) Transportation options
9) Attitudes toward car and driving

Participant Profile

All participants were recruited based on the following criteria:
1) Gender (2 all female groups and 2 all male groups)
2) Age: 70+ years
3) Drive at least ½ of household driving
4) Average number of miles driven per week (minimum 10 in city and 20 in suburbs).
5) Average number of miles per year must be less than 20,000
6) Less likely to drive in at least 3 of the following conditions: night, long distance, rush hour/congestion, freeway/interstate, bad weather, unfamiliar areas.

GROUP	# OF PARTICIPANTS
GROUP 1: September 11 ➢ All female ➢ Age range 70-76	11
GROUP 2: September 11 ➢ All male ➢ Age range 70-82	10
GROUP 3: September 12 ➢ All female ➢ Age range 70-80	10
GROUP 4: September 12 ➢ All male ➢ Age range 70-83	10
TOTAL PARTICIPANTS =	**41**

Discussion Guide

The Hartford Personal Lines Research Department
Massachusetts Institute of Technology

MIT / OLDER DRIVER RESEARCH **Date of this version: 12/5/01**

10 minutes

I. Introduction: Good Afternoon/Evening. Welcome and thanks for participating in....

a. Moderator introduction—My name is _____ and I am here doing research at the request of the Massachusetts Institute of Technology or as some of you may know it, MIT. My role here as a researcher is to get us through a list of specific questions, stay on track, and get us unstuck if we get stuck.

b. How many of you have participated in a **Focus Group** before? A focus group is a research tool used to hear, first hand, what you have to say*!* Instead of me interviewing each of you individually, I want you to think of it as a group interview. Research shows that group interviews are excellent at generating ideas.

c. **"Ground rules":**

1. Balanced participation, hear from all of you
2. Not seeking consensus, no wrong answers, all input (open & honest) is valuable
3. This session is being videotaped / remain confidential--you don't have to worry about turning up in any commercials, one person at a time (audible for tape)
4. An associate / my associate is/are here, because they want to hear first hand your feedback and to ask additional questions if necessary.
5. Pick up monetary gift for being here on the way out
6. Informal / Enjoyable 2 hours discussion.....

d. **Participant Introductions:** Before we begin to talk about why you were invited to participate in today's/tonight's group, I want to learn a bit more about you...In about 30 seconds, Name, age, household composition, hobby/free time activity.

e. **Why You Were Chosen?** All of you were recruited to participate in today's focus group because you are a (female/male) over the age of (65/70) who has tailored your current driving patterns to drive less under certain roadway conditions. We have gathered you here to talk driving and age-related changes. As you look around the table, you are surrounded by all men/women. We have done this because we are very interested in the opinions of men, women, and then of both, a mixed group.

25 minutes

II: Self-Regulation

a. Do you think that most people experience a decline in overall driving ability as they age? [Driving Ability = reflexes, response times, vision, etc.]

b. In thinking about yourself and your own life, over the years since your were in your 40's and 50's, when did you first start to notice that your driving habits or patterns were changing? Can you give me an example of a change you made?

c. How did you modify the "where, when and how" of driving to accommodate for these changes?

Probe: Changed where you go?

Changed when you go? Which trips are you most likely to postpone or not go?

Are there things you can't/ don't do now because you prefer not to drive to where they are?

Is there anything positive about the changes you have made to your driving? For example, do you find now that you have a good reason not to do things or go places that you really didn't like to do or go? [positive impact on quality of life]

Changed how you go—route or mode (bus, taxi) that you didn't before use?

Changed driving techniques on road?

d. Why did you make these driving modifications? Probe: Safety, near accident/accident, stress, continue driving, health status…
Health = heart attack, stroke, surgery, cataracts, medications or medication changes
Doctor or other health professional recommended that you make some changes?

e. Do you believe that there are ways to improve your driving skills in later life? What ways?

f. Have you bought a different car in the past 10 years? When selecting the vehicle did you consider any safety features or other things about that vehicle that would help you to drive better? (i.e., I bought an SUV because it puts me up higher on the road so I can see better.)

30 minutes

III: Class (Remediation) / Model

a. Have you taken a defensive driving class like 55 Alive or the class AAA offers? No / Yes No: Why have you not taken a class such as either of these? Would you?

Yes: Did this class help sharpen/improve your driving skills? Explain…

Probe: education: content
rules of road (state traffic laws/regulations)
vehicle: learn about safety features and proper adjustments/settings to your car
personal health—exercises that people do to help driving
physical driving—road test
technology

Class Model: We would like to build a "winner" driving program for older adults, but we have no idea what it will look like. We need your help! I am passing out a packet that contains some possible components that need to be decided for this program. We will go through this packet together, one page at a time. So let's start with page one. [AAA & AARP "55 Alive" examples]

[Each element below will be on separate page. Participants will be guided to answer one sheet, then guided to the next, etc. When all are complete, we will then go back and discuss each one and come up with a winning model.]

Proximity: Let's assume this driving program is within an acceptable driving distance from your home.

a. **Where/setting**: We would like to find out which setting you find most comfortable for driving program. 1. Cross out settings you don't like; 2) of the remaining, pick top three settings you prefer by numbering them.

Hospital	Rehabilitation Clinic
Motor Vehicle Office	Community Center
Senior Center	Wellness Center
Health Club	Professional Driving School
Mall	College/University
Local Library	Public School

Other_____
Why?

b. **Sponsor**: Which type of organization would you consider the most credible sponsor of driving program? First, cross out settings you don't like. Next, of the remaining, pick the top three setting you prefer by numbering them 1, 2, & 3.

Hospital	Motor Vehicle Office
Senior Center	Wellness Center
Health Club	Professional Driving School
College/University	Auto Insurance Company

Other_____
Why?

b. **Instructor**: What type of person would be the most credible instructor for the class?

[All that will be on the page is a stick figure with the words, gender, age, training background, they will have to describe stick figure]

c. **Cost**: How much would you be willing to pay for such a program?

_____ Get insurance discount?

Winner Model: Pull together top choices to create best model.

5 minutes
Stretch Time: *I am going to check with my team to see if there are any additional questions at this point. Please stretch and feel free to get another beverage…*

10 minutes
Test Credibility

a. As part of the driving program that we just created, is a voluntary test of your individual driving skills, more complicated than the one we all took to get our licenses, it involves a vision, (physical) reflexes, strength, traffic laws, road test, would you take it? Why or why not?
b. [Pass out piece of paper with 5 choices and brief description] Out of the following choices, please rate which is the most accurate predictor of your driving skills? Rate from most accurate to least accurate (believable?)?

(Probe: Why?)

1. Road test: The driver follows a set route. An evaluator rides along but does not provide any help or make any comments during the test. The evaluator will focus on how the driver: obeys traffic laws, handles unexpected situations, allows proper distance when following other vehicles, navigates turns (especially left turns) in traffic, anticipates potential traffic problems, drives safely in the flow of traffic, selects appropriate speed for weather and traffic conditions, safe lane changes. Note will be taken by the evaluator and a written report given to the driver after the test.
2. Computerized Driving Skill Test: The driver sits at a computer with a control stick or a mouse. Instructions are clearly given for each test. The test will assess reaction time, ability to visually track objects and react to them as instructed, ability to recognize objects under certain conditions like glare or "twilight" conditions, ability to quickly switch attention between several objects.
3. Paper-Pencil: The driver completes a written test on traffic laws. In addition, several examples of common traffic situations are presented. The driver answers a series of judgment questions about the correct moves the driver must make in the example.
4. Physical Fitness for Driving Test: The driver is asked to do a series of exercises and physical moves that assess speed of movement, strength

and flexibility. Some of the tests will involve balance, rapid-paced walking, gas/brake pedal tapping, head/neck rotation, visual scanning for objects, delayed recall of directions or words, arm reaching.

5. Computer Simulator Test: The driver sits in an automobile where the engine has been replaced by a computer. A screen in front of the car projects a course for the driver, who encounters various obstacles throughout the drive. The car's brake pedal is designed to mimic the feel of braking while driving in a regular vehicle. The test will assess reaction time, ability to visually track objects and react to them as if in a real driving situation, ability to navigate turns in traffic, and ability to drive safely in the flow of traffic. The test will also assess the driver's physical ability to handle the vehicle in demanding driving situations, by measuring the driver's strength in braking and in turning the wheel.

Discuss ranking order and what is / is most valid or accurate as a predictor of your driving skills. ("Best")

c. How do all of these methods measure up to or compare to your present driving record? Is any one of them more accurate a predictor of your driving skill than your driving record?
d. If you did not pass (failed) any of the above tests, what would you do?
e.If you did not stop driving, do you think you would make any changes to your driving at all?
f. Would it depend on which of the tests you failed?

20 minutes

IV: Family Conversations

1. How would you feel if someone from your family or a "close friend" approached you to tell you that they had concerns about your driving?
2. Who would you feel comfortable talking to you? Probe:

a. spouse	f. grandchild
b. son	g. sibling
c. son-in-law	h. other relative
d. daughter	i. close friend
e. daughter-in-law	j. none of their business

3. Imagine you are having a discussion with a family member or close friend regarding your driving. Imagine this family member or friend saying that they felt your driving skills declined and you should stop driving. What would you do?
   [Original: If a family member/close friend did talk with you regarding your driving and that they felt if was getting poor and you should limit your driving, what would you do?]
   Probe: a. limit driving

b. Ignore the information
c. Tell the person to mind his or her own business
d. Discuss their concerns

4. Family vs. Someone outside Family: How would you feel if someone from outside your family approached you to tell you that they had concerns about your driving?

5. With whom outside your family would you feel most comfortable talking to you?
Probe:
a. Doctor
b. Police Officer
c. MVD Official
d. Insurance Official
e. friend/neighbor

6. Hypothetical: If you felt that your spouse has driving problems, what would you do?
Probe: a. Talk to spouse directly
b. Ask a family member to talk to spouse
c. Ask a doctor or other person in authority to talk to spouse
d. Ignore the issue until something happens (i.e., ticket, accident)
e. Never mention it, just pray

7. Let's all assume that you did talk to your spouse, what would you say to them?
Probe: a. driving cessation
b. modification of driving
c. reassurance that someone will provide transportation

8. Has anyone actually talked to someone else about their driving? Who? How did it go?
[Real-Life-Example: of how people may have tried to regulate another's driving]

9. Would you change your willingness to travel/drive with another person if you thought they had driving problems? Has that ever happened to you?

15 minutes

V: Transportation Options

a. Have you given much thought to how you will do what you need to do, and go where you need to go, in the event that you can no longer drive? What would you do? [neither spouse] Probe: Relative, neighbor, bus or other transit, taxi, senior van service or something else…

b. If you could no longer drive (or spouse), what kinds of things would you like to see available that would allow you to do what you need to do and go where you need to go?

Probe: -a chauffeur service that takes you door to door and waits while you do what you need to do

-New Segway

-Web site dedicated to providing you with whatever services you need

Lastly we would like to talk to you about your attitudes toward driving & your car.

a. I want you to think for a moment about the following two words: enjoyment & stress. We would like you to tell us how your level of enjoyment and stress has changed with respect to your driving over time?
b. How do you feel about driving and your car? What do you get out of driving?

Probe: What else besides independence does it mean? Write all up on board… Rank different qualities of driving: Safety, freedom, independence, personal identity, mobility, etc.

5 minutes

One Last Check With Team For Questions…….

Close: Thank & terminate.

Zagroba, L. (2002). Phase II Focus Group Findings: Older Driver Self-Regulation Research. Hartford, CT, The Hartford Insurance Company.

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